FINAL
SURVEY COMPLETION REPORT
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units Former Naval Station Treasure Island San Francisco, California

Contract Number: N62473-12-D-2005
Contract Task Order: 0005

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Acronyms and Abbreviations

µR/hr	microroentgen per hour
BRAC	Base Realignment and Closure
CB&I	CB&I Federal Services LLC
CDPH	California Department of Public Health
CTO	contract task order
IR	Installation Restoration
mrem/yr	millirem per year
Navy	U.S. Department of the Navy
NSTI	former Naval Station Treasure Island
PRSO	Project Radiation Safety Officer
RASO	Radiological Affairs Support Office
QC	quality control
TI	Treasure Island
TIDA	Treasure Island Development Authority
TSP	*Final Task-Specific Plan, Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units, Former Naval Station Treasure Island, San Francisco, California*
Work Plan	*Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California*
YBI	Yerba Buena Island

1.0 Introduction

This Survey Completion Report presents the specific tasks and procedures that were implemented by CB&I Federal Services LLC (CB&I) during a radiological scoping survey of the housing units at Installation Restoration (IR) Site 12 at former Naval Station Treasure Island (NSTI) (Figures 1 and 2). This report also presents the findings and results of the survey. Ultimately, the data collected and displayed in this report will support the "Finding of Suitability for Lease" process relating to the leasing program of the former military housing units at NSTI. The work was performed for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command Southwest, under Contract No. N62473-12-D-2005, Contract Task Order (CTO) 0005.

CB&I conducted radiological surveys of the interior ground floors of the housing units to assess the exposure health risk to current residents and address data gaps for the IR Site 12 feasibility study radiological addendum. A standardized network of 1-meter by 1-meter grid cells overlaid each housing and garage unit configuration. A survey team then progressed through each unit surveying all accessible grid cells and then collecting stationary measurement data. The measurement data were recorded on a mobile tablet computer. Additional measurements were performed at the direction of the radiological supervisors. There are 726 units (4-8 units per building) available for use by the Treasure Island Development Authority (TIDA) under lease (Figure 2). This radiological scoping survey included ground floor surveys of 594 of the units under lease. Upstairs housing unit configurations (i.e., 1400 series buildings only, totaling 132 housing units) were excluded. Instead, the garage of each respective 1400 series upstairs unit was surveyed. In addition to the 594 housing units surveyed, a total of two-hundred 1400-series building unit garages were surveyed.

In 2012, the Navy issued CTO 0010 to Contract No. N62473-10-D-0807 to perform a non-time critical removal action at the Bigelow Court solid waste disposal area at IR Site 12. The *Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California* (Work Plan; CB&I, 2014a), CTO 0010, includes the same and/or very similar work elements and constitutes the basis for work performed. Clarifications and site specific procedures were captured in the *Final Task-Specific Plan, Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units, Former Naval Station Treasure Island, San Francisco, California* (TSP; CB&1, 2014b) issued under CTO 0005.

Work performed also followed the provisions of the *Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (CB&I, 2013) and the

Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California (CB&I, 2014c, as updated or revised). The work was performed in accordance with the California Radioactive Materials License 7889-07, issued to CB&I. Base Realignment and Closure (BRAC) Program Management Office West managed the work elements under this CTO. The project schedule is included in Appendix A.

1.1 Scope of Work

The scope of work for this project included supporting and attending various meetings, preparing the TSP (CB&1, 2014b), conducting radiological exposure rate surveys in occupied and unoccupied housing units (and garages) at IR Site 12 housing area, and providing the Navy with survey data in support of human health risk assessment.

1.2 Survey Objectives

The objective of this project was to collect and present high quality data from the housing units that are satisfactorily comprehensive to support defensible, real-time decisions to protect human health. The surveys conducted were designed to support no further investigation of the housing units if no radiological impacts were found, or alternatively, support a recommendation that a lease be modified or terminated if radiological exposure exceeded a pre-determined threshold. The project-screening criterion was determined to be 2 microroentgens per hour (µR/hr) above background, not to exceed 10 millirems per year (mrem/year) per agreement between the Navy and California Department of Public Health (CDPH). A no further investigation status determination pertained to residential occupancy of the housing unit. Additional surveys may be required for soil at depth at IR Site 12 as outlined in the *Final Historical Radiological Assessment–Supplemental Technical Memorandum, Naval Station Treasure Island, San Francisco, California* (TriEco-Tt, 2014).

1.3 Guiding Documents

The Work Plan (CB&I, 2014a) developed under Contract No. N62473-10-D-0807, CTO 0010 and the TSP (CB&I, 2014b) developed under Contract No. N62473-12-D-2005, CTO 0005 outlined the work elements and constituted the basis for the work performed. Work activities were accomplished in accordance with California Radioactive Material License 7889-07.

1.4 Project Team Organization

Six survey teams, each consisting of a team lead, a senior survey technician, a junior technician/data recorder, and two movers, were deployed to conduct the surveys. The survey teams reported to an onsite project manager. The work was overseen and supported by radiological supervisors, Health and Safety, and quality control (QC) representatives. Additional information about team participants, personnel responsibilities, and oversight is presented in Section 3.4.1.

1.5 Survey Completion Report Organization

This report is organized into the following sections:

- Section 1.0, "Introduction"—Scope of work performed, objectives, guiding documents, schedule, and project team organization
- Section 2.0, "Site Description'—Description of site conditions and building unit layout descriptions
- Section 3.0, "Fieldwork"—Overview of the instrumentation used, pre-fieldwork activities, and survey site work
- Section 4.0, "Survey Results"—Review of data evaluation, validation, verification, background analysis, survey results, and any anomalies to the survey
- Section 5.0, "Conclusions and Recommendations"—Conclusions and recommendations resulting from the survey data collected
- Section 6.0, "References"

The following appendices supplement this report:

- Appendix A, "Project Schedule"
- Appendix B, "Final Task-Specific Plan"
- Appendix C, "Daily Housing Survey Reports—All reports for each unit provided on a CD
- Appendix D, "Survey Receipt"—Copies of the survey receipt given to the resident at the completion of the survey
- Appendix E, "Human Health Risk Dose Calculations"
- Appendix F, "Instrument Calibration Records"
- Appendix G, "Field Work Variances"—Two Field Work Variances to the TSP were issued during survey work
- Appendix H, "Photograph Log"

2.0 Site Description

This section presents NSTI site conditions and general descriptions of the types of buildings surveyed during this project.

2.1 Site Conditions

Treasure Island (TI) is a 403-acre manmade island located next to a natural rock island, Yerba Buena Island (YBI), in the San Francisco Bay (Figure 1). TI was constructed of materials dredged from the San Francisco Bay from 1936 to 1937 for the Golden Gate International Exposition of 1939 and 1940. In 1940, the Navy began leasing NSTI from the City and County of San Francisco and later, during World War II, gained full ownership of NSTI. YBI, a 147-acre natural island, has been under military control since 1867. The primary function of YBI was to provide training, administration, housing, and support services to the U.S. Pacific Fleet. In 1993, NSTI was designated for closure under the Base Realignment and Closure Act of 1990. NSTI was operationally closed on September 30, 1997.

In 1999, at the request of the City of San Francisco, by and through the TIDA, the Navy leased the former military housing on NSTI to the City of San Francisco. The housing area is located on the northwestern portion of NSTI.

The housing area was originally used as a parking lot during the Golden Gate International Exposition of 1939 and 1940 and was later developed for bunker storage of munitions and other materials, vehicle and equipment storage, recreational playing fields, and disposal and burning of waste. Beginning in the 1960s, the areas were incrementally developed into housing for Navy personnel and their dependents. The former military housing consists of multiplex housing units with private backyards and common area front yards, side yards, and surrounding greenbelts.

Today, the former military housing is used for market-rate housing and supportive services. The housing area is approximately 105 acres. There are 726 units (4 to 8 units per building) available for use by TIDA under lease (Figure 2). This radiological scoping survey included ground floor scoping surveys of 594 units under lease. Upstairs housing unit configurations (i.e., 1400 series buildings only, totaling 132 housing units) were excluded. Instead, the garage of each respective 1400 series upstairs unit was surveyed. In addition to the 594 housing units surveyed, a total of two-hundred 1400 series building unit garages were surveyed. Table 1 lists the housing providers currently managing the leases and the addresses of the units that were surveyed under this CTO. Figures 3 through 19 show the building unit floor plans.

2.2 Building Unit Layouts

The following subsections describe the site conditions as they relate to each type of building configuration included in the radiological scoping surveys.

2.2.1 1100 Series Buildings

The 1100 series housing community is located on the northwest end of NSTI and consists of 240 units built in 1966 (Figure 2). The units consist of three- and four-bedroom, two-story apartments with four to eight units per multiplex. The buildings are wood frame constructions on concrete slab foundations with a mix of composition shingle and built-up roofs. Original exterior stucco walls have been covered with vinyl siding, except for storage sheds and second floor overhangs. Each individual unit has a forced air furnace and water heater located in a mechanical room (utility) accessible from the outside of the unit. Figures 3 and 4 (corner kitchen), and 5 and 6 (center kitchen) show the layout of the three-bedroom 1100 series units; Figures 7 and 8 show the layout of the four-bedroom 1100 series units.

2.2.2 1200 Series Buildings

The 1200 series housing community is located on the northwest end of NSTI and was built in 1969 (Figure 2). There are 340 units with two-, three-, and four-bedroom, two-story apartments with four to eight units per multiplex. The buildings are wood frame constructions on concrete slab foundations with a mix of composition shingle and built-up roofs. The original exterior stucco walls have been covered with vinyl siding, except for storage sheds and second floor overhangs. Each multiplex has a centralized hydronic heating unit and water heater located in a mechanical room on one end of the building that serves all the unit that are part of the multiplex. Figures 9 and 10 show the layout of the two-bedroom 1200 series units; Figures 11 and 12 show the layout of the three-bedroom 1200 series units; Figures 13 and 14 show the layout of the four-bedroom 1100 series units.

2.2.3 1300 Series Buildings

The 1300 series housing community consists of 124 units built in 1970. These multiplexes are located on the northwestern end of NSTI (Figure 2). The multiplexes consist of four-bedroom, two-story apartments with four to six units per multiplex. Buildings are wood frame constructions on concrete slab foundations with composition shingle roofs. The original exterior wood siding has been covered with vinyl siding, except for second floor overhangs. Each individual unit has a forced air furnace and water heater located in a mechanical room located inside the unit. Figures 15 and 16 show the layouts for the 1300 series units.

2.2.4 1400 Series Buildings

The 1400 series housing community is the most recently constructed on NSTI and consists of 200 units built in 1989. The multiplexes are located on the northwest end of the island. Units are

two-bedroom apartments with four to six units per multiplex. Buildings are wood frame constructions on concrete slab foundations with composition shingle roofs. Exterior walls are stucco with brick trim on some of the multiplexes. Each individual unit has a forced air furnace and water heater located in a mechanical room inside the unit. Figures 17 and 18 outline the unit configurations. One-car garages associated with the 1400 series buildings were also surveyed and their layouts are included as Figure 19.

3.0 Fieldwork

This section presents a description of the TSP (CB&I, 2014b) that governed the execution of the work, instrumentation, and tools used during the scoping survey. It also provides further details as to how the fieldwork was executed.

3.1 Final Task-Specific Plan

In 2012, the Navy issued CTO 0010 to Contract No. N62473-10-D-0807 to perform a non-time critical removal action at the Bigelow Court solid waste disposal area at IR Site 12. The Work Plan (CB&I, 2014a), CTO 0010, included the same and/or very similar work elements as the radiological scoping surveys conducted under this CTO 0005 and constituted the basis for the work performed. Clarifications and site-specific radiological scoping survey procedures were captured in the TSP (CB&1, 2014b) (Appendix B).

3.2 Instrumentation

The primary instrument that was used to determine compliance with the project-screening levels was the Ludlum Model 193-6 survey meter, described in Section 3.2.1. Survey data were recorded on mobile tablets as detailed in Section 3.2.3. If needed, additional investigation was performed using the instruments discussed in Section 3.2.1.

3.2.1 Ludlum Model 193-6

Housing unit scans were performed using the Ludlum Model 193-6 as designated in the TSP (CB&I, 2014b). The instrument has a 15.2-centimeter (6-inch) diameter by 2.5-centimeter (1-inch) thick plastic scintillator (Ludlum Model 44-132) mounted at the end of an extended reach pole. The senior survey technician operated a four-scale analog rate-meter attached to the opposite end of the pole.

The detector measures gamma radiation over a wide range of energies. Measurements during this survey were recorded to the nearest tick-mark on the meter face on the x10 scale, with no interpolation between tick marks. On this scale, measurements were observed and recorded in increments of 0.4 µR/hr (e.g., 3.2, 3.6, 4.0, 4.4).

The instrument was used with the audio response transmitted through a headset to the technician. The "fast" response was used during the scan of each survey grid cell. For the final stationary measurement within each cell, the "slow" response setting was used. Upon entry into each housing unit, an instrument background measurement was collected at a default location of 1 meter in from the front door, 4 inches above the floor surface. This measurement was stored within the Ludlum Model 193-6 for the duration of the surveys within the housing unit and was

used as the basis for the 2 sigma internal alarm setpoint, as well as the 2 µR/hr above background screening level. If follow-up investigations were performed and the instrument background was reset, the technician returned to the original background measurement location to re-collect the measurement to complete the remainder of the housing unit.

In the event that the project-screening level of 2 µR/hr above background at a 4-inch height was exceeded, additional investigation was conducted to obtain further information on the area to confirm the measurements and identify appropriate next steps using one or more of the following:

- Floor contact measurement using Ludlum Model 193-6.
- 4 and 12 inches above floor surface measurements using Ludlum Model 193-6.
- 3 feet above floor surface (waist level) measurement using Ludlum Model 193-6.
- Collection of systematic measurements using the Ludlum Model 193-6 and if necessary, the Ludlum Model 2221 rate-meter/scaler with a Ludlum Model 44-20 3-inch by 3-inch sodium iodide detector at 6-inch and 12-inch intervals from the apparent center of the anomaly. Measurements were collected at a 4-inch height at nine locations (one measurement at the center of the "bull's-eye" and additional measurements along each directional axis). For the purposes of this survey, "north" corresponded to the upward orientation of the survey map.
- Radionuclide identification using Canberra Inspector 1000 multi-channel analyzer (or equivalent), such as identification of lead and bismuth energy peaks associated with radium-containing materials. Data were collected with the detector on contact with the highest measurement location for a minimum 10-minute collection time.

All additional measurements obtained were documented in the tablet database for that specific area/unit.

3.2.2 Ludlum Model 19 MicroR

The Ludlum Model 19 MicroR meter was used to supplement the use of the Ludlum Model 193-6 survey areas that were not accessible to the that instrument.

The handheld Ludlum Model 19 MicroR instrument uses a 1-inch by 1-inch sodium iodide scintillation detector to measure gamma radiation over a wide range of energies. Measurements during this survey were recorded to the nearest tick-mark on the meter face on the x1 scale, with no interpolation between tick marks. On this scale, measurements were observed and recorded in increments of 1.0 µR/hr (e.g., 3.0, 4.0, 5.0, 6.0).

The use of this supplemental instrument was authorized by the Project Radiation Safety Officer (PRSO) or alternate PRSO on a survey cell specific case basis to support data gathering when

moving a piece of furniture or an appliance was deemed not possible either due to the fragility of the furniture, the security of the furniture to a wall or garage, or due to the installation method (water/gas lines) of the appliance. The Ludlum Model 19 MicroR was placed either under or aside the non-movable item to validate that elevated gamma activity was not present within the cell. The instrument was used with the audio response on. The "fast" response was used during the scan of the selected survey grid cell. For the final stationary measurement within each cell, the "slow" response setting was used.

Prior to each authorized use of the Ludlum Model 19 within the housing unit, an instrument background measurement was collected at the default location of 1 meter in from the front door, 4 inches above the floor, similar to the process implemented of the Ludlum Model 193-6. The background and cell measurements were recorded on the tablet for each of the units being surveyed and all measurements and type of instrument used were documented on the unit survey report.

3.2.3 Tablet and Software

Data from the scoping surveys performed were recorded in the field on a mobile tablet computer. The tablet database contained the first floor layout of each housing unit and was overlaid with a standardized 1-square-meter grid to facilitate survey performance, mapping, and comparison between housing units. Each survey grid cell was subject to scanning and a stationary measurement unless obstructions prevented survey access. Each exception was reviewed by the radiological supervisors in the field to assess alternative methods for collecting data within the obstructed cell to ensure as a complete data set as technically possible. The tablet visually displayed the survey progress within each housing unit to allow the survey team to identify locations requiring survey. When measurements above the established screening criterion were entered (i.e., measurements that exceeded the 2 µR/hr above–background screening level following a subtraction of the housing unit specific background level), the tablet database prompted the technician team for additional measurements. Similarly, the tablet provided options to record percent accessible due to built-in appliances, exteriors, or unmovable furniture. Notes and photographs of the obstruction were collected to supplement readings where 100 percent of the housing unit's survey cells could not be surveyed.

Once the survey in a housing unit was complete, data from the tablet were uploaded to a secure cloud-based CB&I server for further QC review and reporting. The use of the tablets and the cloud-based server facilitated immediate QC of the data entered and permitted additional data to be entered if a data record correction was required. Once QC review is complete and approved, the data were locked to prevent altering. Consistent and close to real-time data reports were then issued for Navy review and approval.

3.3 Pre-Fieldwork Activities and Meetings

The Navy hosted an Open House Public Meeting on May 31, 2014 at the Casa de la Vista Building 271 at TI to present the planned approach for the radiological scoping surveys in the housing units at IR Site 12. The Open House was a collaborative event between the Navy, TIDA, Department of Toxic Substances Control, and CDPH.

Prior to starting the scoping survey fieldwork, CB&I hosted a one-day orientation session on June 10, 2014 at TI that focused on the survey approach and instrument capabilities. The Navy, TIDA, housing providers, and CDPH attended. The goal of this session was to familiarize all involved parties on how the radiological instruments worked and further explain the survey process within the residents' unit. A field demonstration of the survey process inside two vacant units was also performed as part of the orientation session agenda.

A pre-construction meeting between CB&I, the Navy, and Navy Resident Officer In Charge of Construction was held on June 2, 2014, prior to mobilization of teams to the housing units. The purpose of the meeting was to discuss project-specific topics, roles, and responsibilities of all project personnel, project schedule, health and safety, QC of the data, and the communication plan for field activities.

In addition, prior to the official start date, all survey team leaders and radiological technicians attended a two-day training session to familiarize the teams to the proper protocol during surveying, the instruments, tablet protocol, and site safety. A reconnaissance survey of available (vacant) housing units was also conducted prior to start of actual fieldwork. This survey facilitated a good understanding of housing unit layouts and allowed the field team to develop an efficient way to overlay the radiological survey grid within the unit.

3.4 Execution of Fieldwork

This subsection discusses the makeup of the survey teams and how the fieldwork was executed and documented in reports.

3.4.1 Survey Teams

Six CB&I field teams conducted surveys within the housing units. The CB&I field teams each consisted of five personnel. The specific roles and responsibilities of each team member were as follows:

- Team Supervisor: Primary interface with Navy/TIDA liaisons; primary contact with project management team
- Senior Survey Technician: Primary user of Ludlum Model 193-6 for survey
- Junior Technician: Primary individual recording data on the tablet

- Movers (two): Assisted in carefully moving furniture as needed and assisted with grid layout within the unit to facilitate the scoping surveys

CB&I radiological supervision, consisting of the PRSO and the Alternate PRSO, provided oversight and specialized survey directions during the performance of all surveys. The CB&I Project QC Manager performed field monitoring/surveillance during survey activities.

In addition to CB&I personnel, a minimum of one representative from the Navy and the housing providers were on site, and on call as needed. Representatives from CDPH were on site throughout the project to provide regulatory oversight. Oversight of the survey process was also provided by Radiological Affairs Support Office (RASO).

3.4.2 Housing Unit Work Sequence

A work notice was distributed to each housing unit a minimum of 48 hours prior to the planned survey of the designated housing unit. CB&I worked with the Navy, housing providers, and TIDA to prepare the work notice, which included information about the work activities, duration, timeframe, and contact information should residents have questions. The work notice was distributed to the residents by the housing providers at NSTI.

Upon entry into the housing unit, the team supervisor and TIDA liaison conducted an initial visual survey of the first floor to identify any obvious safety hazards or survey obstructions. The team supervisor briefed the field team on any possible challenges, and began the coordination of furniture movement. As part of the field activity daily log for each unit, the team supervisor documented the general use of each room if varying from the floor plan and recorded key locations of furniture. Exterior utility shed and storage-shed floors were also included in the performance of the housing unit survey. Laborers/movers used hand-trucks, furniture slider pads, moving blankets, etc., to safely move furniture within the housing units. A flatbed truck was also available on site for the temporary staging of personal belongings. Furniture and appliances were moved to facilitate access to the survey grid, unless moving a piece of furniture or an appliance was deemed not possible either due to the fragility of the furniture, the security of the furniture to a wall, or due to the installation method (water/gas lines) of the appliance. Alternate survey methods were employed to assess the survey grid under or adjacent to non-movable furniture or appliances.

The Radiological Control Technicians and field team supervisor identified the layout of the unit and selected the correct survey template on the tablet. Additional initial information, including housing unit identification, surveyor identification (senior survey technician), and instrument serial numbers, was entered as well.

3.4.3 Individual Housing Unit Background Measurements

Once the survey team had completed the initial visual survey and the type of housing unit layout had been identified, housing unit-specific background levels were established. The senior survey technicians measured the background reading at a standardized location one meter directly inside the front door of the living units or one meter directly inside the garage door in the garage units. This measurement was recorded on the tablet before the unit survey could begin. Unexpected low or high background measurements would be immediately reported to the on-site radiological supervisor.

3.4.4 Radiological Scans

The senior survey technicians progressed through the housing unit to perform scanning measurements of 100 percent of the area from each accessible 1-meter by 1-meter grid cell. Data collection for areas that were inaccessible or partially accessible are further described and discussed in Section 3.4.5. During the scan, the senior survey technician listened for the audio response (via a headset) from the instrument's internally calculated 2 sigma alarm. If scan measurements within the cell did not identify locations exceeding the project-screening levels, a stationary exposure rate measurement was collected from the center of each 1-meter square cell and recorded on the tablet.

The stationary measurement was recorded on the tablet for each cell within the layout. The measurement was compared with the project-screening levels and if any were exceeded, the technician was prompted for additional survey action before moving to the next measurement location. When this occurred, the team supervisor contacted the radiological supervisor. The radiological supervisor then notified project management and Navy RASO. In this instance as well as when measurements were slightly elevated above background but less than 2 µR/hr above background, additional measurements were collected under the guidance of the onsite radiological supervisor and were recorded on the tablet as accumulated data supporting notes.

CDPH representatives provided continuous oversight of the teams and their survey techniques to make sure that teams were surveying in compliance with the TSP (CB&I, 2014b) guidelines. The CDPH representatives rotated their observation between teams throughout the day. When elevated readings were encountered, CDPH representatives were notified and often collected readings alongside the survey team for verification of the elevated reading.

3.4.5 Areas with Restricted Survey Access

Several circumstances lead to areas with partially restricted survey access. These included:

- Installed appliances including washers/dryers, stoves, dishwashers, water heaters, furnaces.

- Installed base cabinets in the kitchens.
- Non-movable furniture and storage shelves/racks—Best efforts were made to move all personal belongings to gain access to 100 percent of each housing unit's floor space. Some items that contained fragile items, housed large aquariums, or were of too fragile construction could not be moved.

All areas posing restricted access were reported by the team supervisor to the radiological supervisor who would prescribe the collection of additional measurements, alternate measurements using different instruments (e.g., Ludlum Model 19 which offered better access due to size), or concurrence to survey around the restricted access area. The decisions and additional survey data were carefully documented on the tablet for each instance and housing unit.

3.4.6 Daily Housing Unit Survey Reports

The survey within a housing unit was considered complete when all survey cells were measured or otherwise documented and annotated; elevated measurements were investigated; and relocated furniture had been moved back to its original position. The survey data from each housing unit were captured in daily housing unit survey reports (Appendix C). The team supervisor reviewed the completeness and results of the survey in each report with the onsite radiological supervision prior to departure from the unit. To finalize the survey record in the tablet, the team supervisor and senior survey technician then electronically signed the form. Once the survey was approved by the onsite radiological supervision, a survey receipt was left by the team supervisor for the resident detailing the timeline for processing the survey results and contact information for the Navy if questions arose (Appendix D).

To minimize disturbance to the residents of occupied housing units, surveys of occupied housing units were scheduled to be completed in one entry. Unoccupied units offered flexibility and were typically scheduled at the end of the day to allow for the survey team to partially complete a survey before the end of the work day. When re-entering and continuing the survey of a housing unit on the second day or beyond, a new background check, as well as rechecks of selected survey grids as designated by the radiological supervisor, were performed and compared to the previous background measurement and survey grids measurements. These rechecks were conducted to validate the measurements using the same instrument. Once the survey in a housing unit was complete, data from the tablet were uploaded to a secure cloud-based CB&I server for further QC review and reporting. For unoccupied units, the survey receipt was left with the designated housing provider.

At the end of each day, the team supervisors and senior survey technicians reviewed the day's surveyed units with the Project QC Manager for completeness before the reports were generated for radiological supervisor review.

Prior to the Project QC Manager's daily electronic transmission of the survey reports to the Navy BRAC Project Manager, Navy Resident Officer In Charge of Construction and RASO for data review/comment/approval, the radiological supervisor and Project QC Manager performed an additional, final completeness review of each downloaded report to verify survey results, evaluate background and cell survey measurements, and accuracy and relevance of supporting survey comments. Additional scoping survey supporting documentation, such as the identification of obstructions, staircase locations, alternate measurement methods or locations or surveys performed over the floor surface were recorded on the tablet and were included as additional notes in the survey report. Each survey unit completion report was also uploaded to a secure electronic SharePoint portal where Navy personnel with assigned individual passwords could review the report and evaluate progress.

RASO performed reviews of each survey report and provided corrective action comments and/or survey report approvals. A total of 794 units (594 housing units and 200 garages) were surveyed between June 10 and August 20, 2014.

4.0 Survey Results

This section discusses the data evaluation process, validation and verification of the data, background levels used, and scoping survey data results.

4.1 Data Evaluation

Radiological survey data were analyzed quantitatively for direct comparison to the project-screening levels and reviewed qualitatively to determine whether further investigation was appropriate. Locational data, area- or item-specific photographs, and visual observations were used as qualitative inputs.

The data analysis for the scoping surveys described in Section 3.4 included the following activities:

- Compilation of summary statistics for individual housing units
- Review of data for trends and outliers
- Review of data collection for completeness and conformance with project requirements

Survey data were analyzed to identify distribution trends and potential outliers (Table 2). A preliminary data analysis of survey results was performed in the field, as necessary, to evaluate whether an investigation or collection of additional survey data is warranted.

4.2 Data Validation and Verification

Survey data were reviewed to verify that they were authentic, appropriately documented, and technically defensible. The review criteria for data acceptability were as follows:

- The instruments used to collect the data were capable of detecting the radiation types and energies of interest at or below the radiological screening level.
- The calibration of the instruments used to collect the data was current, and the radioactive sources used for calibration were traceable to the National Institute of Standards and Technology.
- Instrument response was checked before and, where required, after instrument use each day data were collected.
- The minimum detectable concentrations and the assumptions used to develop them were appropriate for the instruments and the survey methods used to collect the data.

- The survey methods used to collect the data were appropriate for the media and types of radiation being measured.

Where one or more of the criteria were not met, the TSP and project procedures called for the review of the discrepancy and documentation of the reasons for acceptability of the data or the corrective actions taken to restore data acceptability. The data collected during the surveys met the above criteria, and there were no questions of data acceptability.

4.3 Background Analysis

Background levels of the gamma emissions detected by the Ludlum Model 193-6 and the Ludlum Model 19 used during the scoping surveys were, as anticipated, influenced by naturally-occurring radioactivity present in the fill material under the housing units; the concrete foundations of the housing units; and other building materials or personal items, such as ceramic, brick, and granite. There are no equivalent housing units outside of IR Site 12 at NSTI; therefore, no directly-comparable (in terms of construction) reference areas were available. Prior to performance of the scoping surveys, a baseline study was performed to identify potential ranges of background with the Ludlum Model 193-6 at various non-impacted locations at NSTI to obtain an understanding of expected background values. These locations included Buildings 1125 and 1233, Building 570, Building 1, and others as appropriate. These measurements established background values between 3.2 and 4.4 μR/hr. This aligns with prior experience of performing work at NSTI as a significant variability in background response for the Ludlum Model 193-6 instruments was not anticipated.

As noted in Section 3.2.1, the Ludlum Model 193-6 records an eight-second background measurement following instrument startup or reset. The standard background collection point within each residential unit was metered into the interior of the residence, at the center point of the front doorway, at a height of 4 inches. Background measurements during the scoping survey were expected to be between 2.8 and 5.0 μR/hr for the instruments utilized. Measurements beyond the lower or upper boundary of the expected background measurements were evaluated by onsite radiological supervision, and alternate representative background locations were established by the onsite radiological supervision. All accumulated or utilized background measurements were recorded on the tablet survey report.

4.4 Scoping Survey Data Results

A total of 794 units (homes and garages) were surveyed during this project. The project was completed in 10 weeks. On average, 16 housing units were surveyed each day. A summary of the survey results is provided in Table 3.

Within the 794 housing units and garages surveyed, three locations were identified as having elevated measurements, i.e., measurements exceeding the expected contribution of natural

radioactivity. Two of the three measurements were above the 2 µR/hr greater than background screening value (Table 4). Onsite representatives from CDPH were notified upon the identification of each of these three elevated measurements, and CDPH representatives performed real–time overview of CB&I's collection of measurements and data. CDPH also collected their own additional confirmation measurements by using a Canberra Inspector 1000 and/or Falcon 5000 MCA that they had brought with them to support the data collection process. RASO performed an assessment of the elevated field measurements during the initial telephone communication of the elevated measurements, and then formalized the estimate of potential exposure to the occupant following receipt of the transmitted CB&I survey report (Appendix E). The potential exposure estimates were provided to Navy BRAC and CB&I and are summarized in Table 4.

In addition to the three elevated and specifically assessed measurements listed in Table 4, several items or materials used in the construction of the housing units were routinely identified as containing naturally-occurring radioactive materials. The common use of the naturally occurring radioactive materials did provide discernible measurements greater than the individual housing unit background measurement. These materials are described in Table 5.

5.0 Conclusions and Recommendations

This section discusses conclusions and recommendation for future work as well as the results of the scoping surveys.

5.1 Conclusions

The scoping survey and data collection process was implemented within the interior of the 794 housing units and garages to assess the exposure health risk to current residents, address data gaps for the IR Site 12 feasibility study radiological addendum, and to support the Finding of Suitability for Lease process as related to the TI lease program.

The scoping surveys did identify three discrete locations of slightly elevated gamma radioactivity, which potentially could result from historical Naval operational activities at TI. None of these objects present a significant health risk requiring immediate removal; however, removal of all discrete objects is required prior to the Navy completing the cleanup action at IR Site 12.

Potential exposure rates to a housing unit occupant were calculated for each of these three discrete locations taking into consideration gross and net measurements at 12 inches above the floor and occupancy factors. The calculations showed potential exposure rates ranging between 1.7 to 5.5 mrem/yr. These calculated values are not considered to be a health hazard to the occupants.

5.2 Recommendations

The three discrete locations present potential exposure rates to the occupants ranging between 1.7 and 5.5 mrem/yr. These calculated values are not considered to be a health hazard to the occupants. Therefore, no further control or immediate remedial action is required. The calculated exposures do not significantly contribute to the exposure normally received from non-occupational sources of radioactivity on an annual basis. The 5.5 mrem/yr calculated maximum exposure is comparable to the exposure received during one transcontinental round trip flight.

Prior to or during the demolition of Buildings 1240, 1241, and 1303, it is recommended that the objects at the three discrete locations are extracted under radiological controls to ensure the waste resulting from the building demolition is correctly characterized and disposed.

6.0 References

CB&I Federal Services LLC (CB&I), 2013, *Final Accident Prevention Plan, Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*.

CB&I, 2014a, *Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California,* May.

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Ludlum Measurements, Inc. 2013, <www.ludlums.com>.

TriEco-Tt, 2014, *Final Historical Radiological Assessment–Supplemental Technical Memorandum, Naval Station Treasure Island, San Francisco, California,* July.

Figures

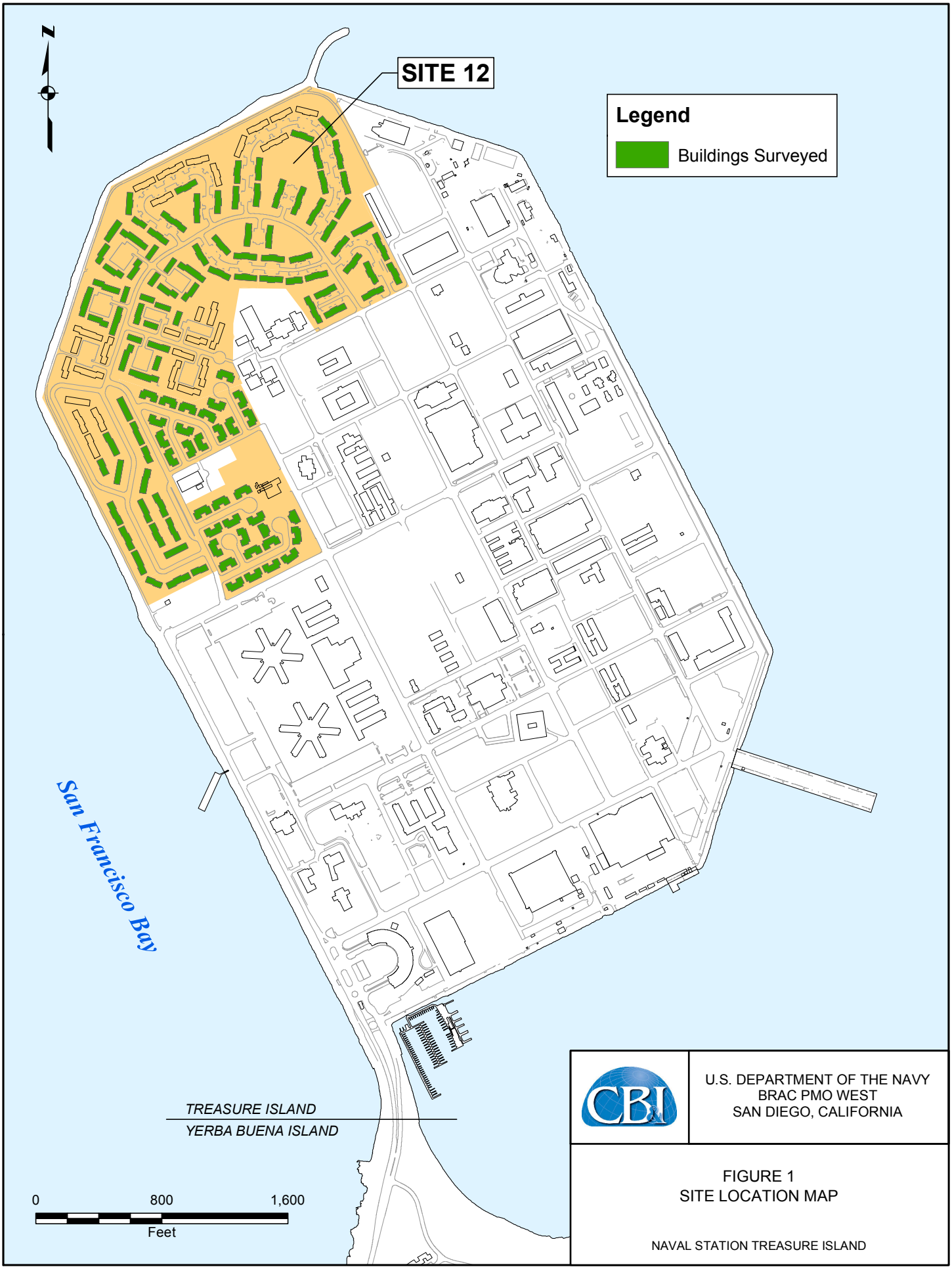

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FIGURE 1
SITE LOCATION MAP

NAVAL STATION TREASURE ISLAND

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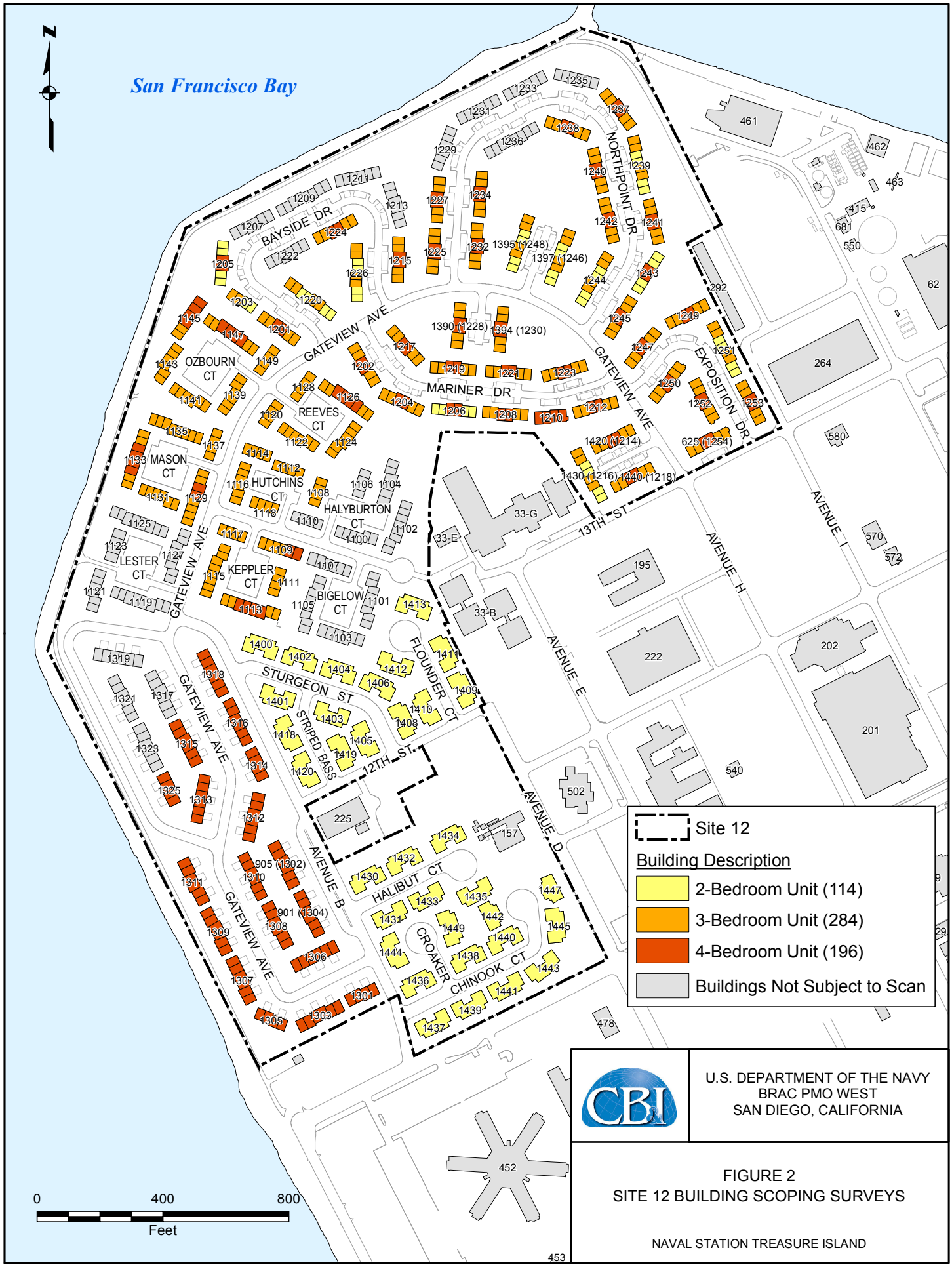

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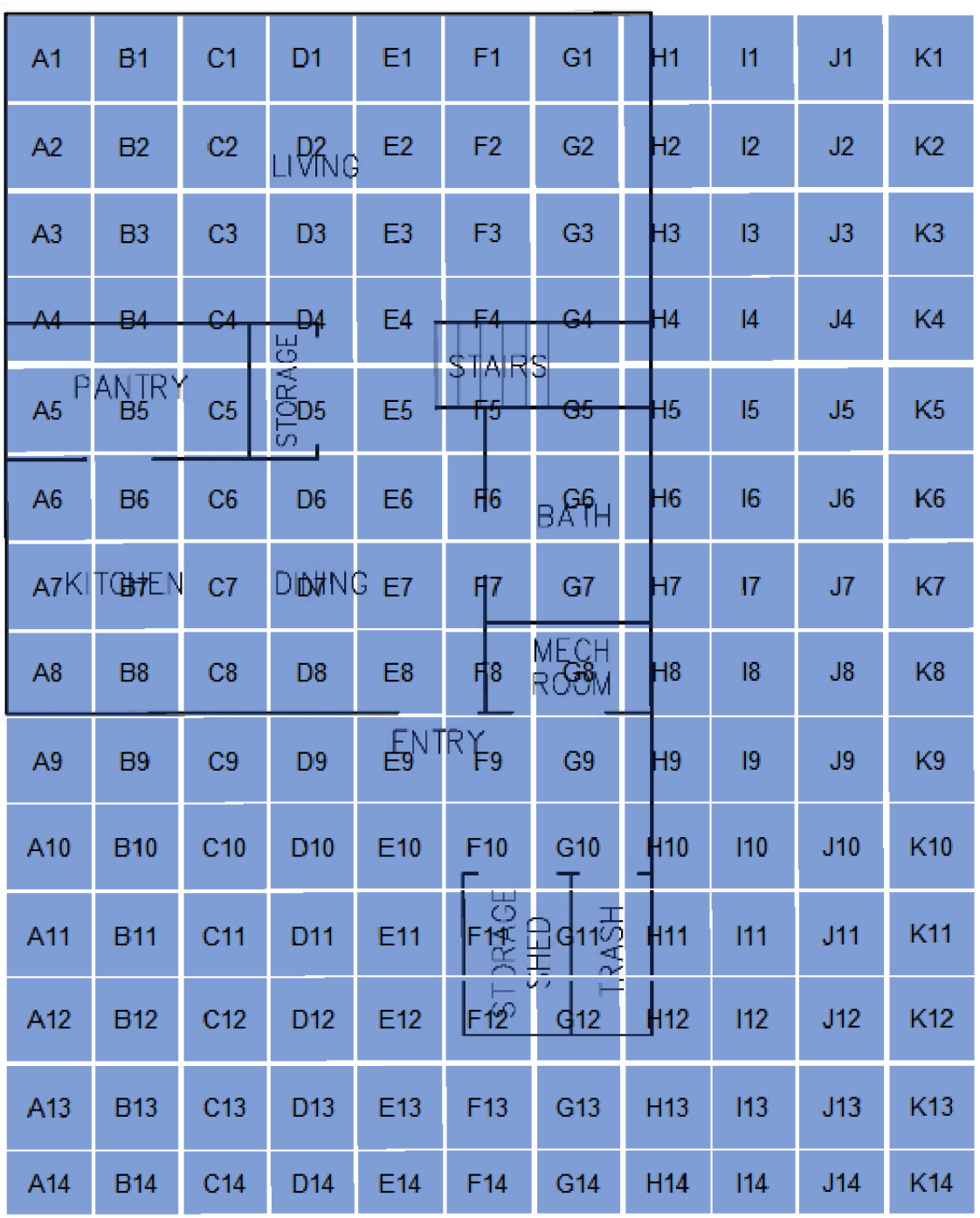

Floor Plan 1 Summary

Number of Units Surveyed:	8
Average Unit Dimensions (m):	D 7.7 W 7.1
Average # of Grids Surveyed:	64
Average # of Survey Readings:	80
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	4.0
# Occupied/ Furnished Units:	7
# Unoccupied/ Unfurnished Units:	1
# Units where Tenant Present for Survey:	7
# Units where Tenant Not Present for Survey:	1

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FIGURE 3
FLOORPLAN 1 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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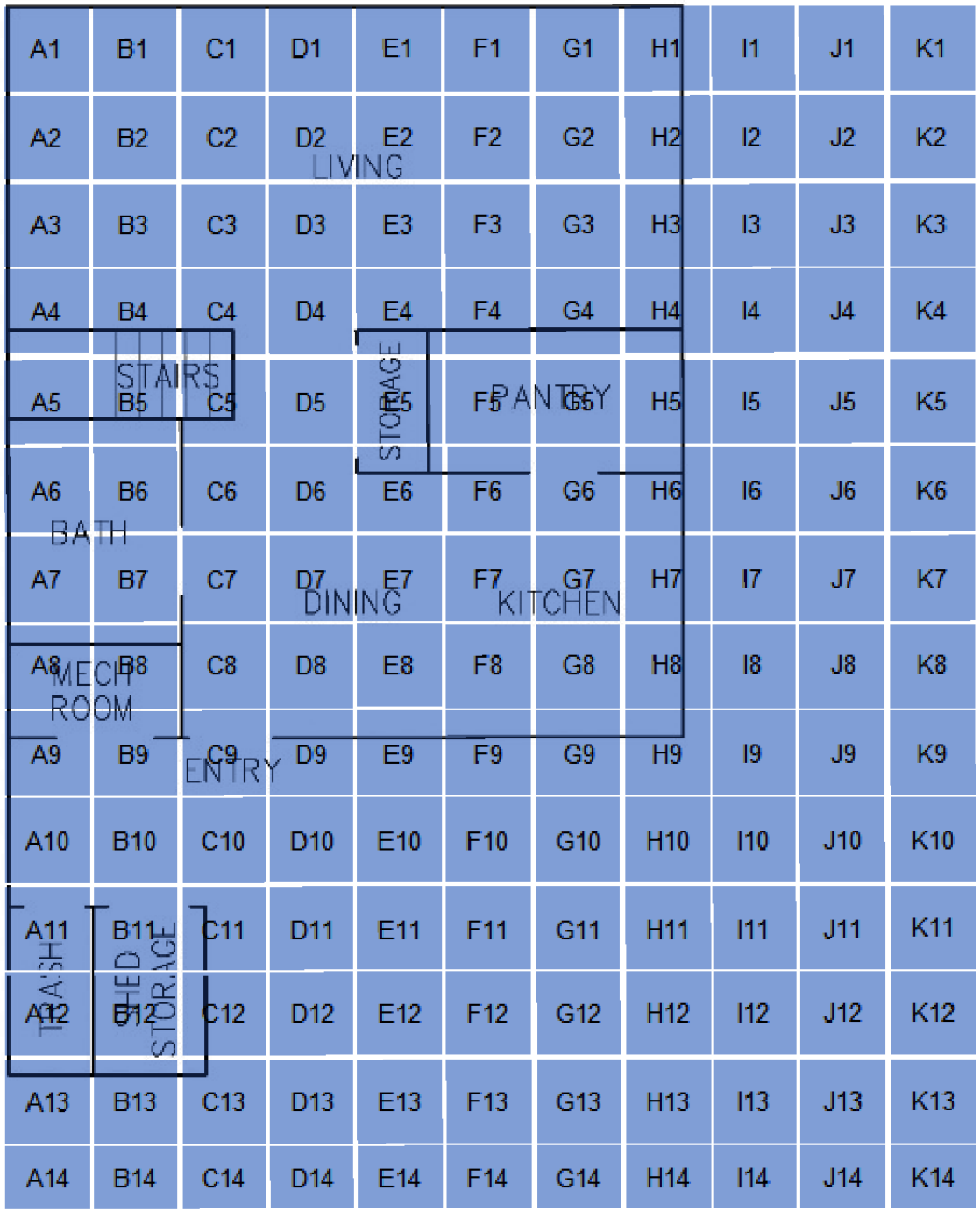

Floor Plan 1B Summary

Number of Units Surveyed:	8
Average Unit Dimensions (m):	D 7.7 W 7.1
Average # of Grids Surveyed:	72
Average # of Survey Readings:	74
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	4.0
# Occupied/ Furnished Units:	8
# Unoccupied/ Unfurnished Units:	0
# Units where Tenant Present for Survey:	8
# Units where Tenant Not Present for Survey:	0

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FIGURE 4
FLOORPLAN 1B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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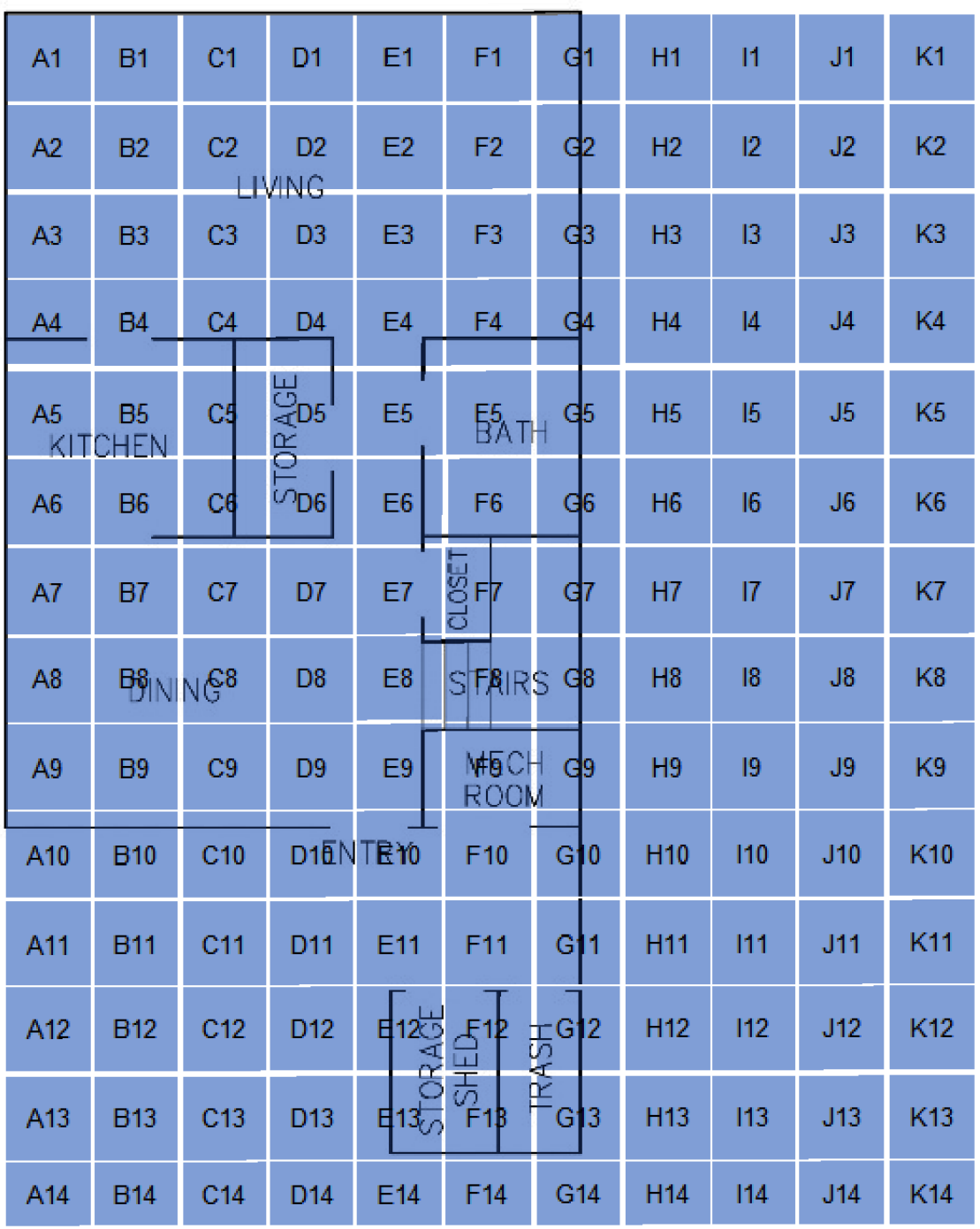

Floor Plan 2 Summary

Number of Units Surveyed:	55
Average Unit Dimensions (m):	D 9.0 W 6.3
Average # of Grids Surveyed:	74
Average # of Survey Readings:	87
Minimum Background Reading (µR/hr):	2.4
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	6.0
# Occupied/ Furnished Units:	45
# Unoccupied/ Unfurnished Units:	10
# Units where Tenant Present for Survey:	42
# Units where Tenant Not Present for Survey:	13

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FIGURE 5
FLOORPLAN 2 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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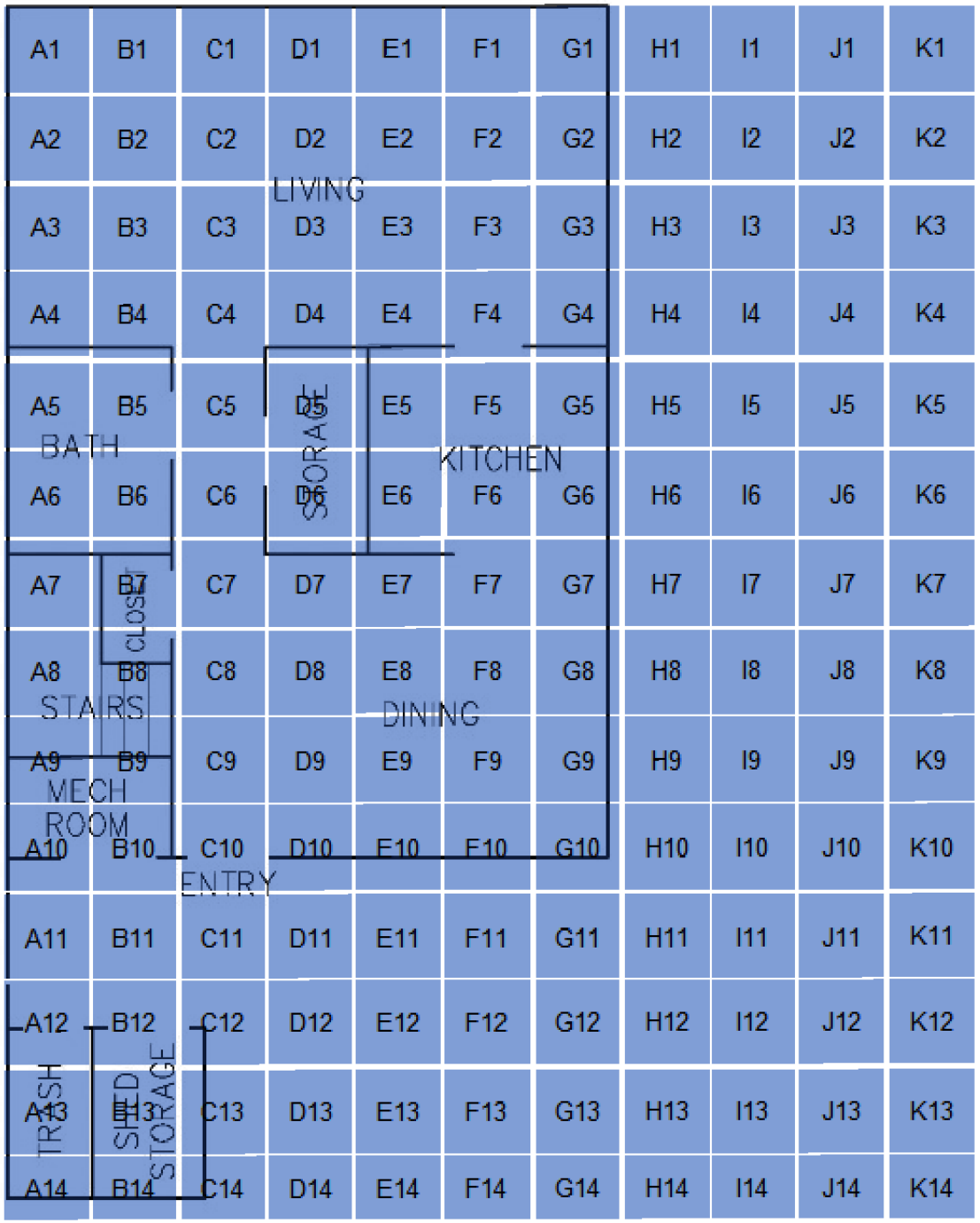

Floor Plan 2B Summary

Number of Units Surveyed:	55
Average Unit Dimensions (m):	D 9.0 W 6.3
Average # of Grids Surveyed:	76
Average # of Survey Readings:	82
Minimum Background Reading (µR/hr):	2.4
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.0
# Occupied/ Furnished Units:	45
# Unoccupied/ Unfurnished Units:	10
# Units where Tenant Present for Survey:	45
# Units where Tenant Not Present for Survey:	10

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FIGURE 6
FLOORPLAN 2B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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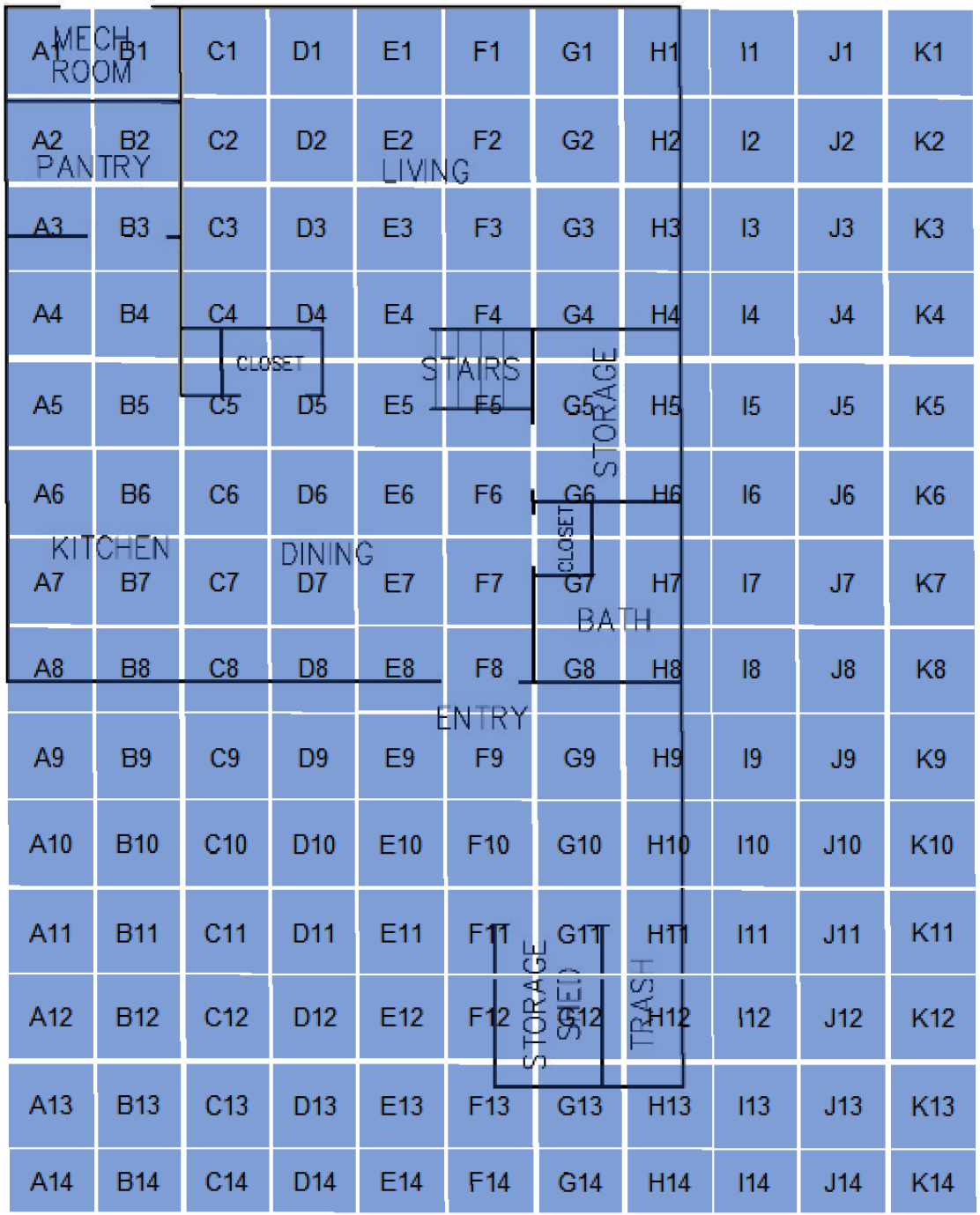

Floor Plan 3 Summary

Number of Units Surveyed:	12
Average Unit Dimensions (m):	D 7.4 W 7.4
Average # of Grids Surveyed:	73
Average # of Survey Readings:	88
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	4.8
# Occupied/ Furnished Units:	8
# Unoccupied/ Unfurnished Units:	4
# Units where Tenant Present for Survey:	7
# Units where Tenant Not Present for Survey:	5

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FIGURE 7
FLOORPLAN 3 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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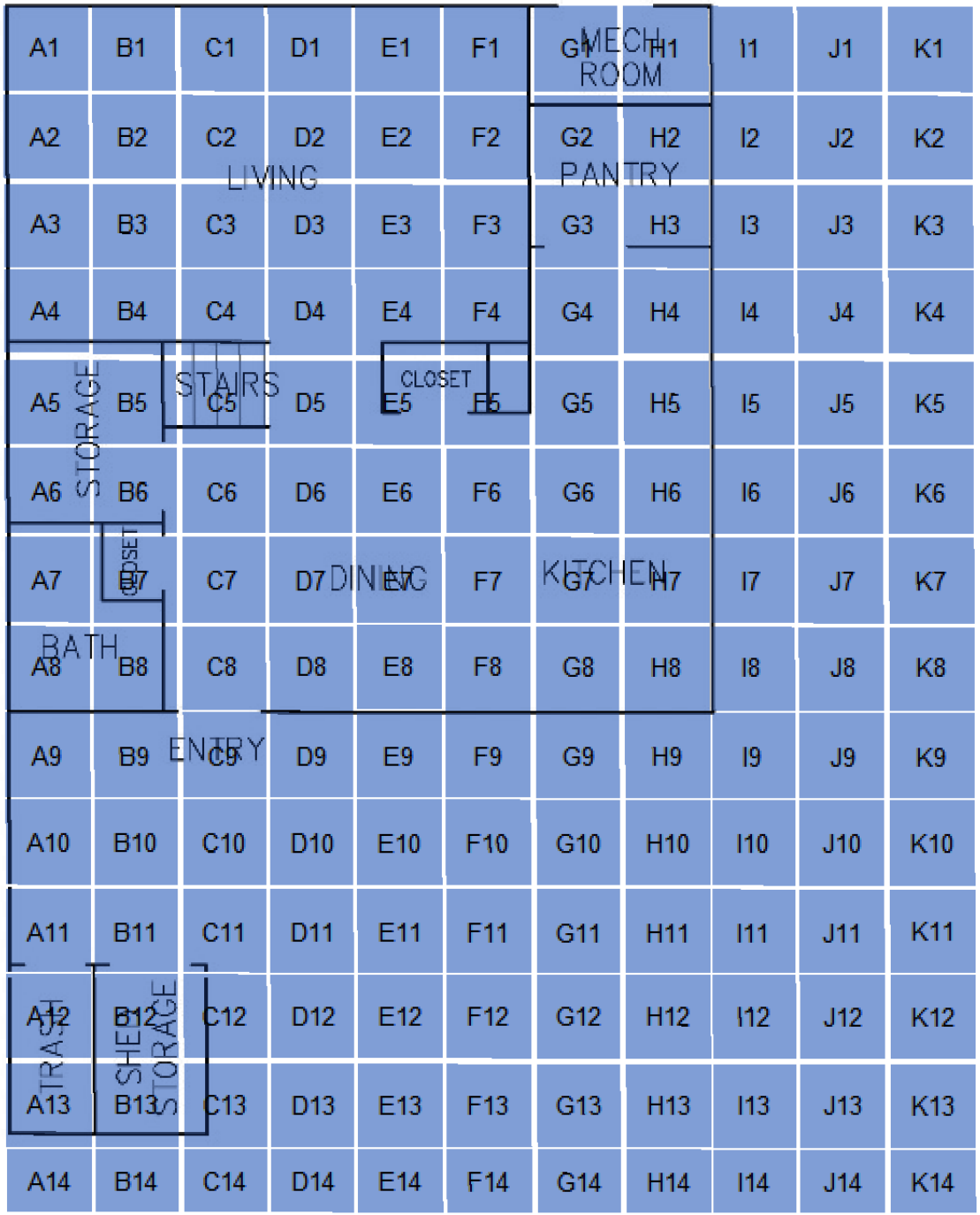

Floor Plan 3B Summary

Number of Units Surveyed:	12
Average Unit Dimensions (m):	D 7.4 W 7.4
Average # of Grids Surveyed:	71
Average # of Survey Readings:	91
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	4.4
# Occupied/ Furnished Units:	10
# Unoccupied/ Unfurnished Units:	2
# Units where Tenant Present for Survey:	10
# Units where Tenant Not Present for Survey:	2

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FIGURE 8
FLOORPLAN 3B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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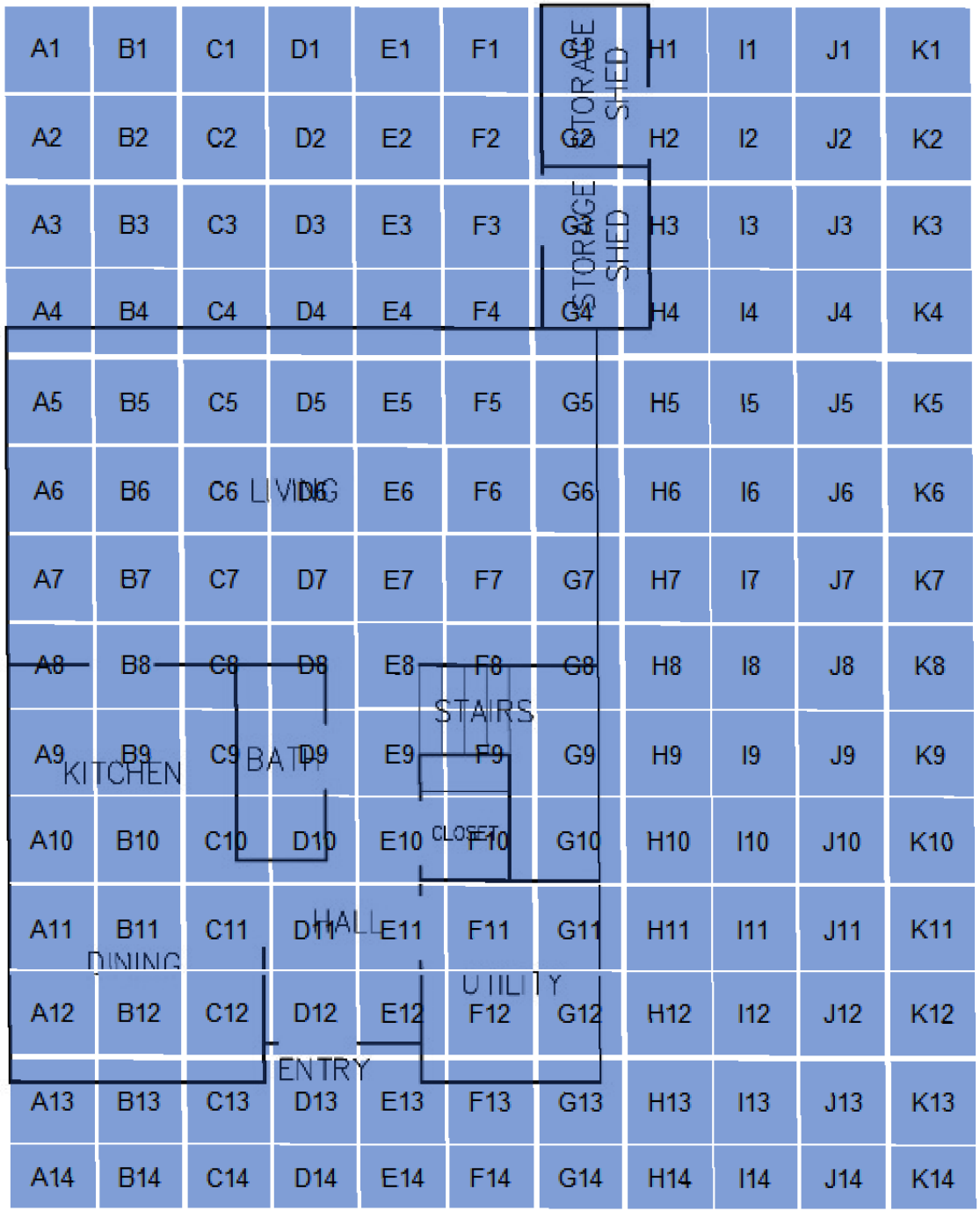

Floor Plan 4 Summary

Number of Units Surveyed:	23
Average Unit Dimensions (m):	D 8.3 W 6.5
Average # of Grids Surveyed:	74
Average # of Survey Readings:	84
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	6.0
# Occupied/ Furnished Units:	21
# Unoccupied/ Unfurnished Units:	2
# Units where Tenant Present for Survey:	19
# Units where Tenant Not Present for Survey:	4

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FIGURE 9
FLOORPLAN 4 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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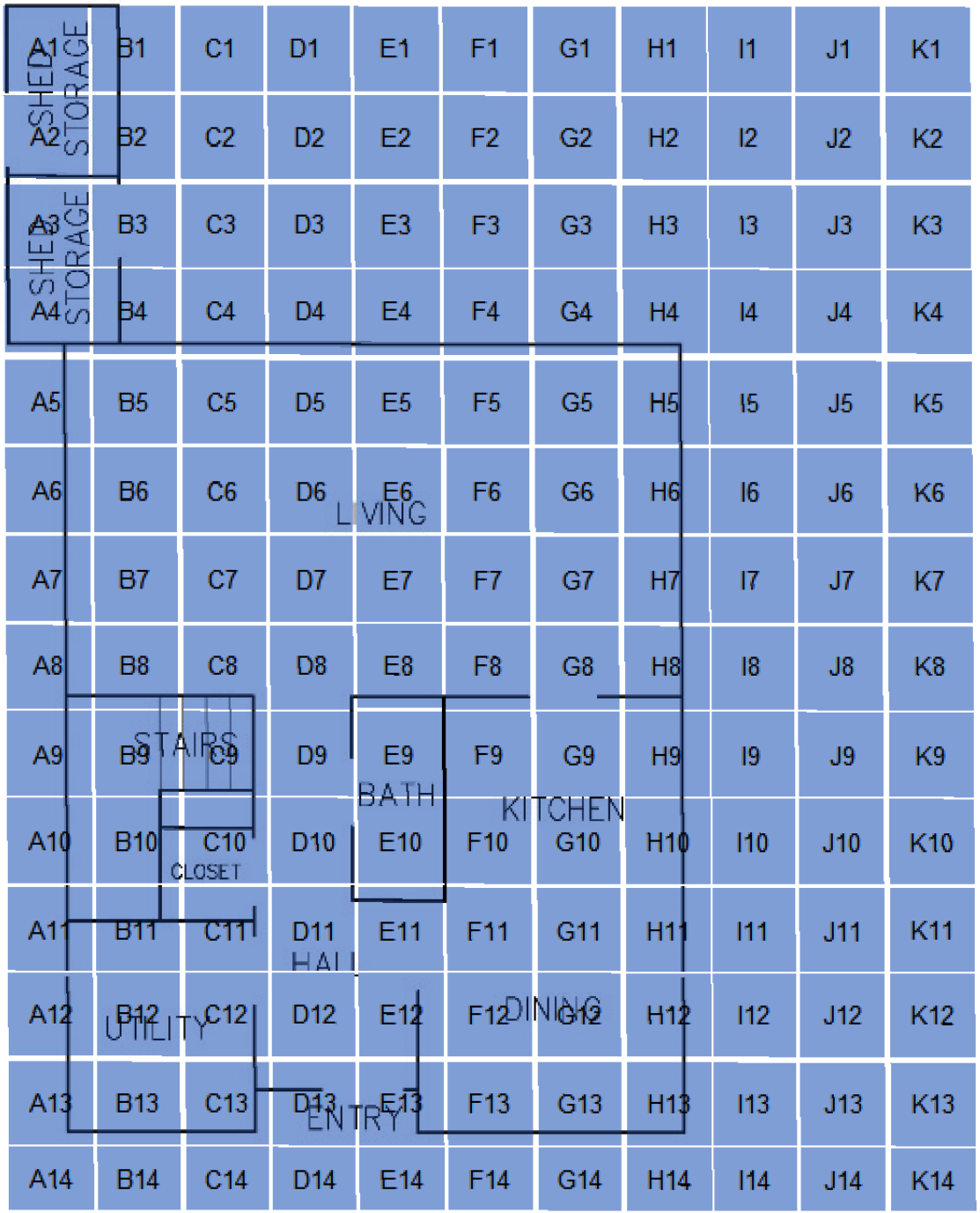

Floor Plan 4B Summary

Number of Units Surveyed:	23
Average Unit Dimensions (m):	D 8.3 W 6.5
Average # of Grids Surveyed:	84
Average # of Survey Readings:	97
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.2
# Occupied/ Furnished Units:	19
# Unoccupied/ Unfurnished Units:	4
# Units where Tenant Present for Survey:	19
# Units where Tenant Not Present for Survey:	4

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FIGURE 10
FLOORPLAN 4B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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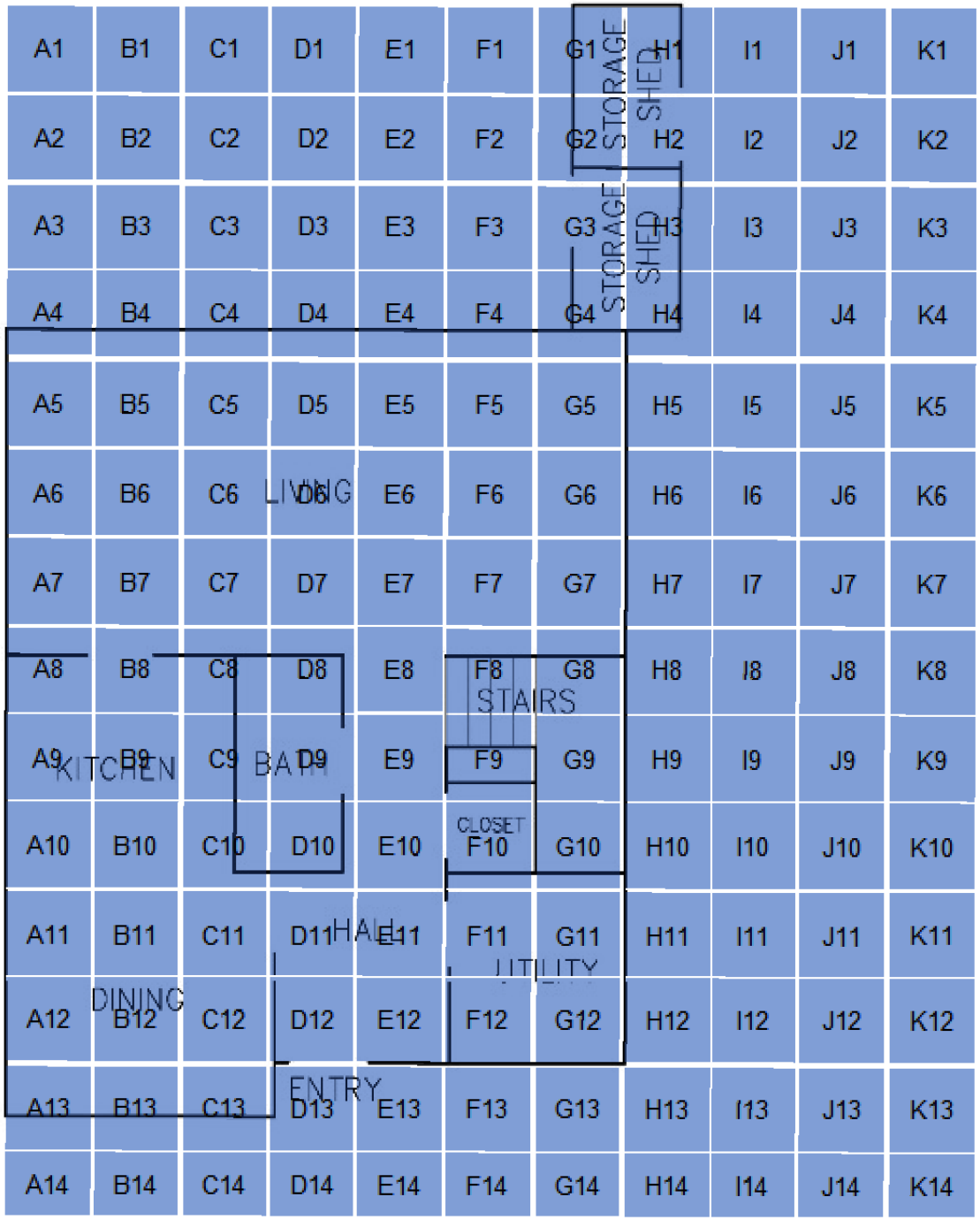

Floor Plan 5 Summary

Number of Units Surveyed:	79
Average Unit Dimensions (m):	D 8.6 W 6.8
Average # of Grids Surveyed:	73
Average # of Survey Readings:	80
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.6
# Occupied/ Furnished Units:	65
# Unoccupied/ Unfurnished Units:	14
# Units where Tenant Present for Survey:	63
# Units where Tenant Not Present for Survey:	16

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FIGURE 11
FLOORPLAN 5 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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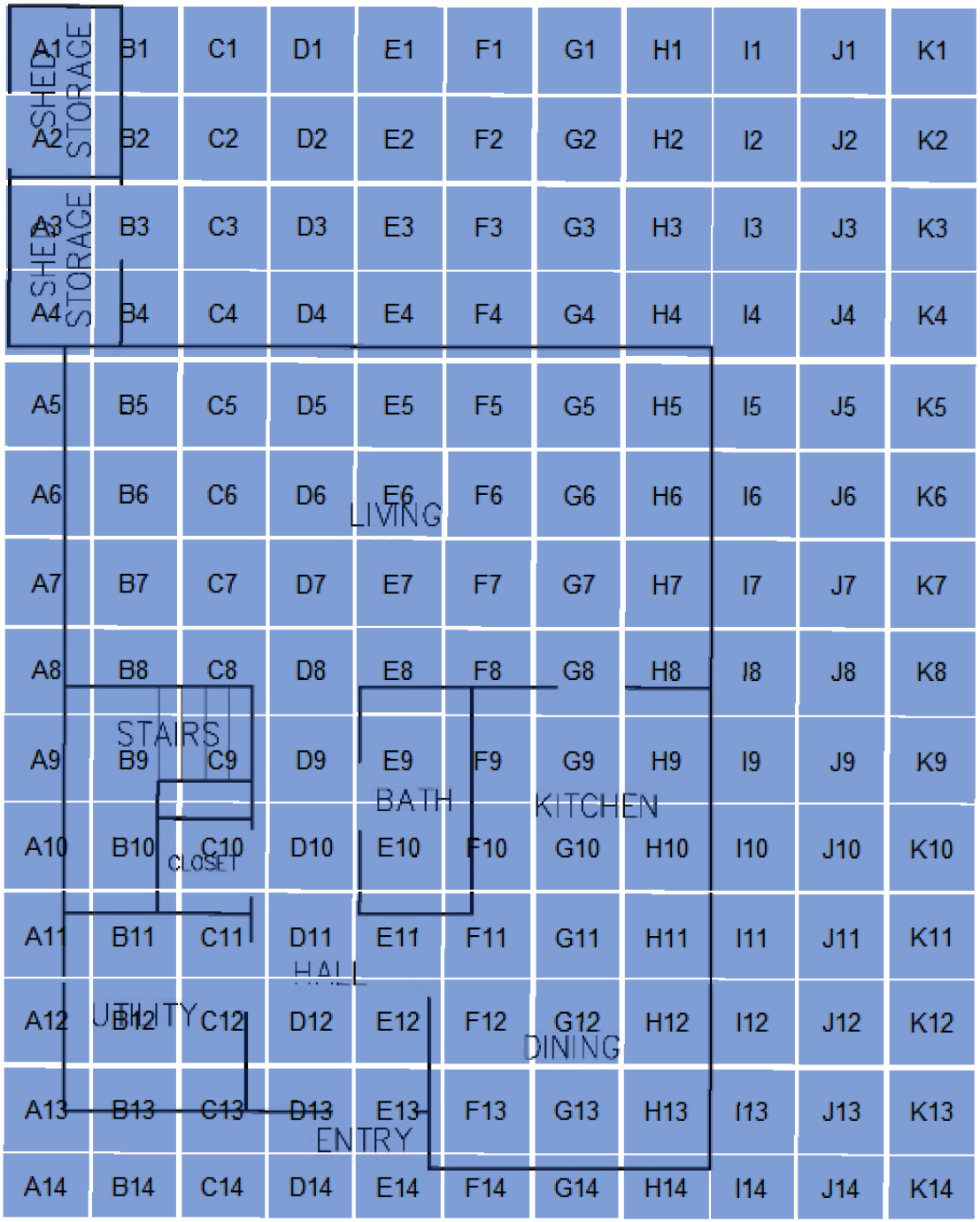

Floor Plan 5B Summary

Number of Units Surveyed:	79
Average Unit Dimensions (m):	D 8.6 W 6.8
Average # of Grids Surveyed:	83
Average # of Survey Readings:	89
Minimum Background Reading (µR/hr):	2.4
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.2
# Occupied/ Furnished Units:	67
# Unoccupied/ Unfurnished Units:	12
# Units where Tenant Present for Survey:	60
# Units where Tenant Not Present for Survey:	19

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FIGURE 12
FLOORPLAN 5B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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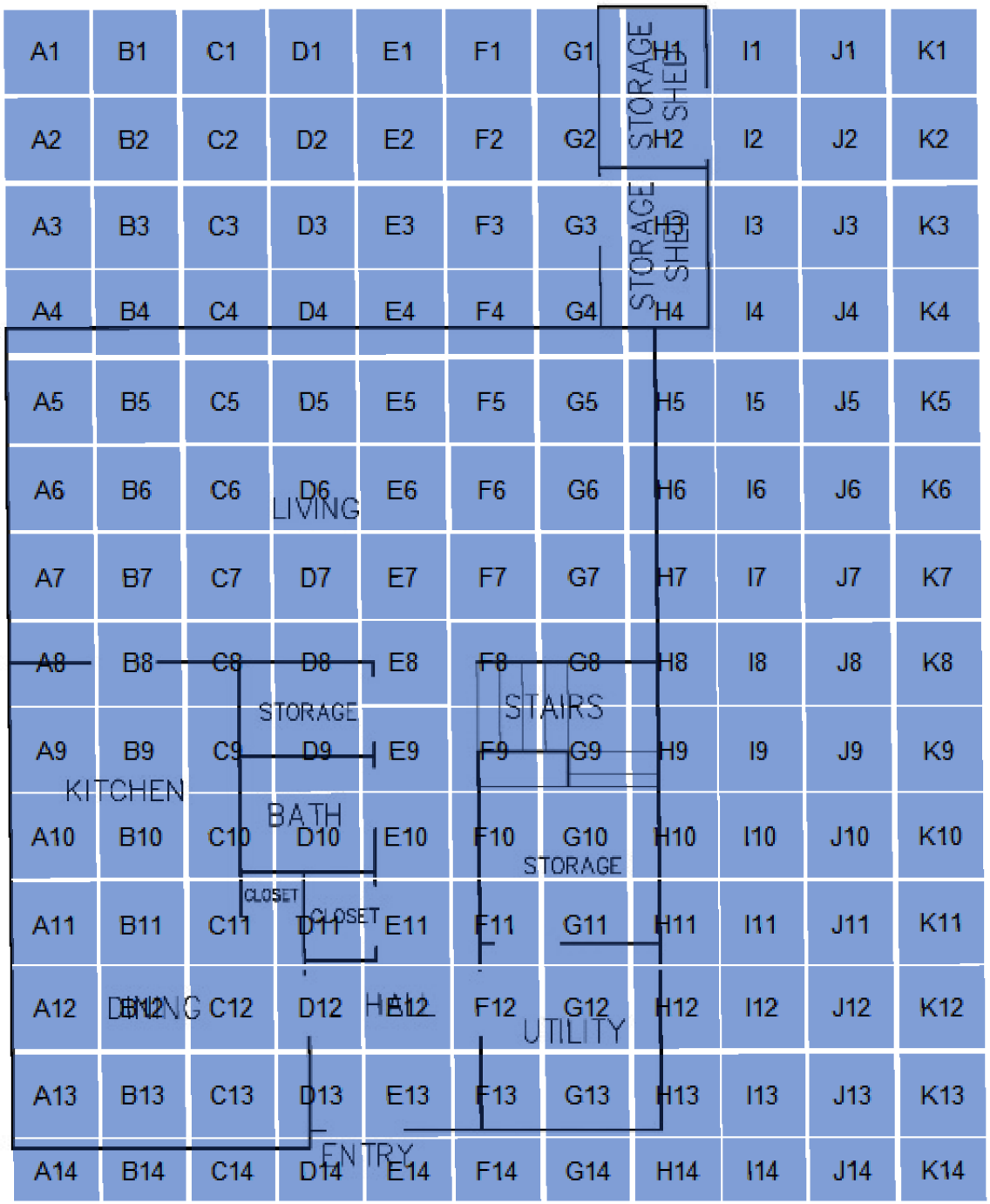

Floor Plan 6 Summary

Number of Units Surveyed:	36
Average Unit Dimensions (m):	D 9.2 W 7.1
Average # of Grids Surveyed:	78
Average # of Survey Readings:	92
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.0
# Occupied/ Furnished Units:	25
# Unoccupied/ Unfurnished Units:	11
# Units where Tenant Present for Survey:	23
# Units where Tenant Not Present for Survey:	13

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FIGURE 13
FLOORPLAN 6 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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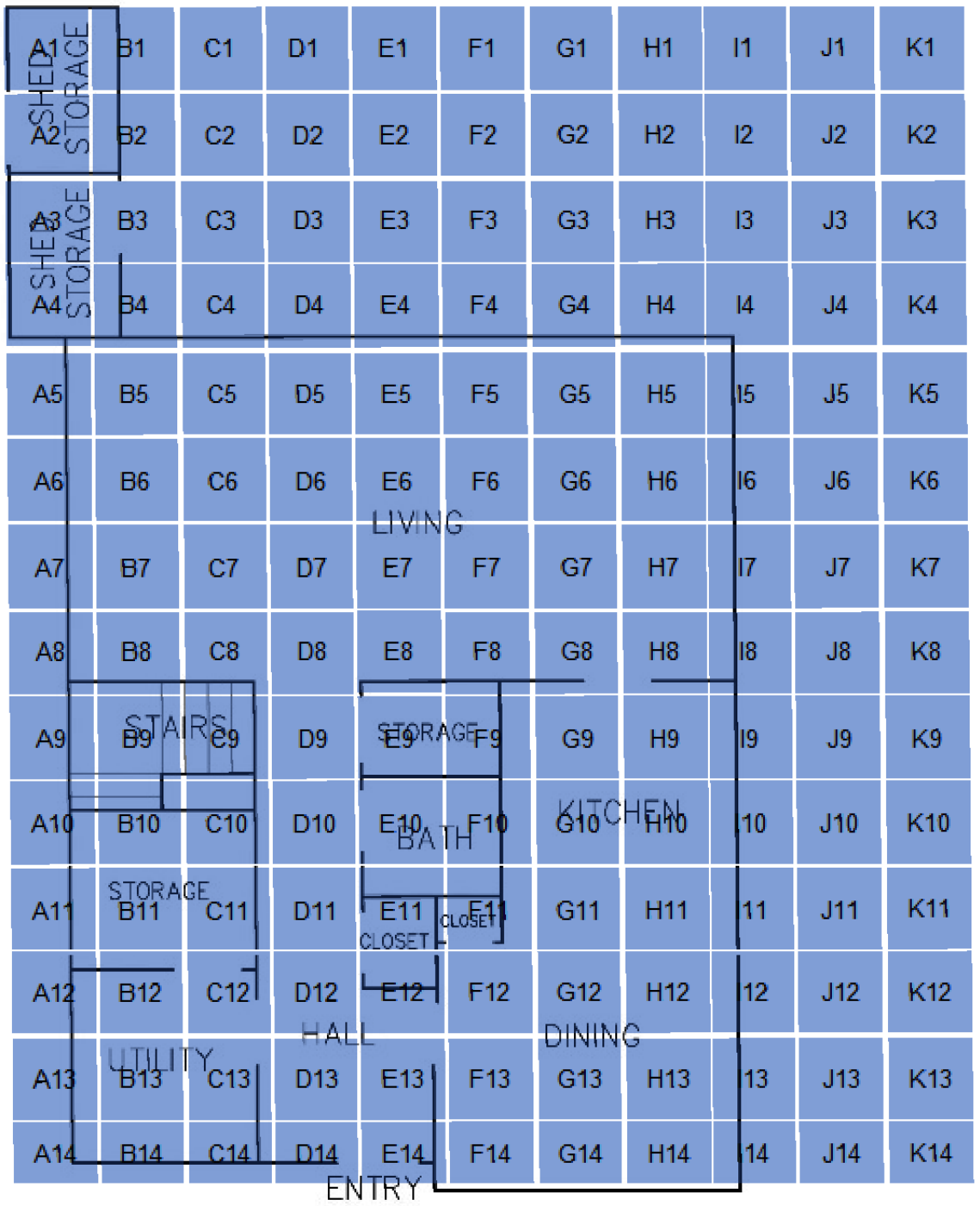

Floor Plan 6B Summary

Number of Units Surveyed:	36
Average Unit Dimensions (m):	D 9.2 W 7.1
Average # of Grids Surveyed:	90
Average # of Survey Readings:	95
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	6.0
# Occupied/ Furnished Units:	29
# Unoccupied/ Unfurnished Units:	7
# Units where Tenant Present for Survey:	28
# Units where Tenant Not Present for Survey:	8

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FIGURE 14
FLOORPLAN 6B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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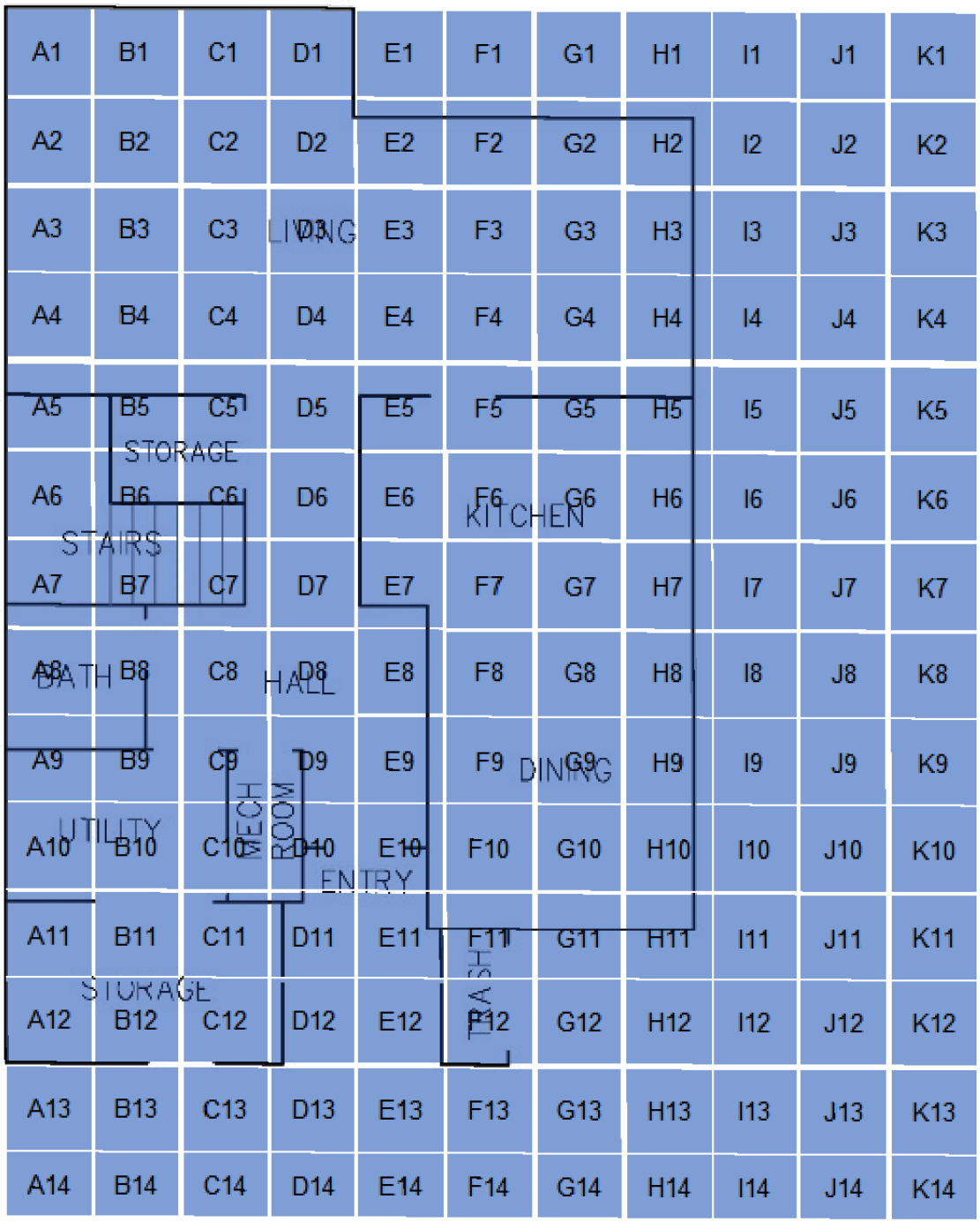

Floor Plan 7 Summary

Number of Units Surveyed:	50
Average Unit Dimensions (m):	D 11.7 W 7.6
Average # of Grids Surveyed:	89
Average # of Survey Readings:	109
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	3.6
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	8.8
# Occupied/ Furnished Units:	32
# Unoccupied/ Unfurnished Units:	18
# Units where Tenant Present for Survey:	30
# Units where Tenant Not Present for Survey:	20

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FIGURE 15
FLOORPLAN 7 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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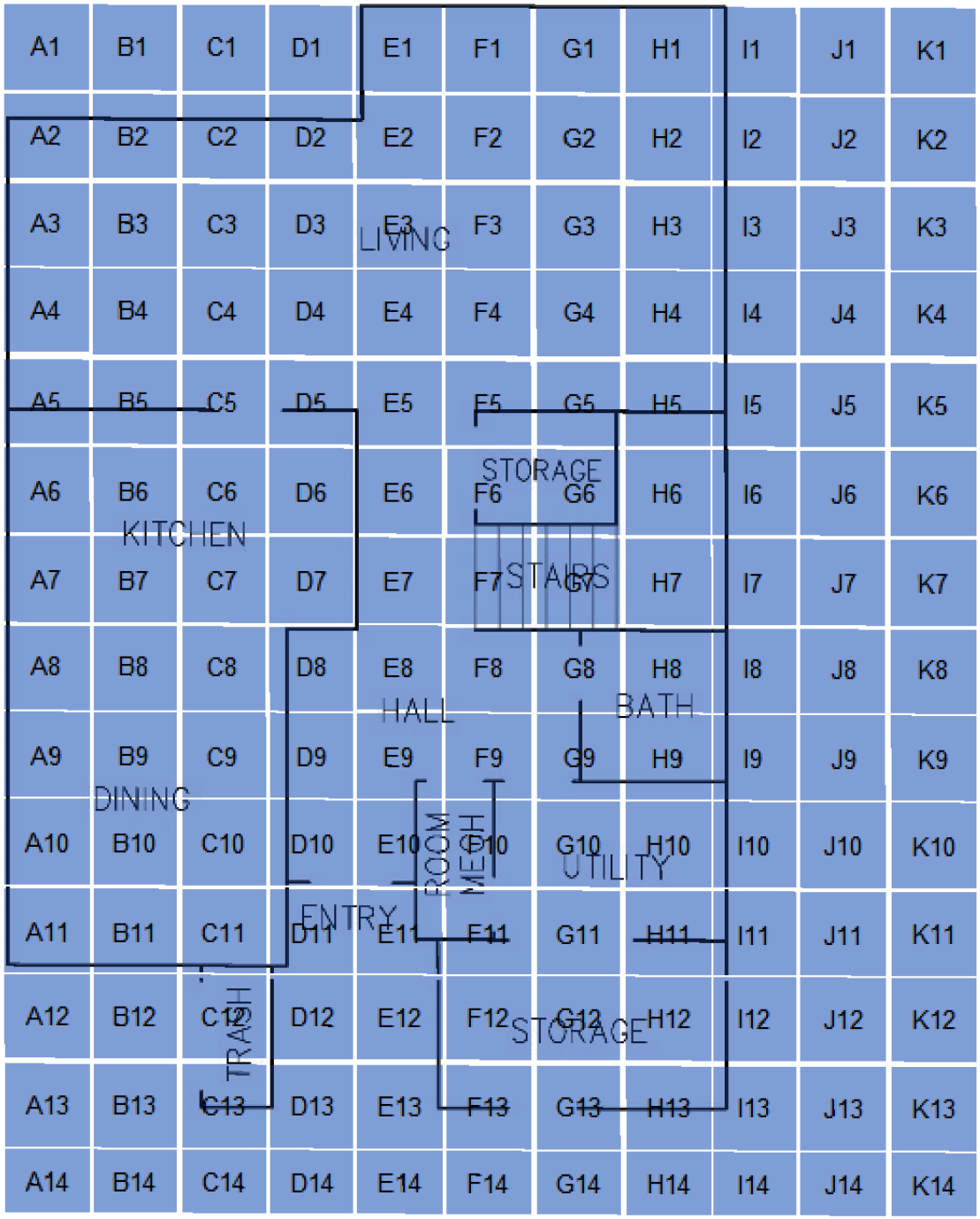

Floor Plan 7B Summary

Number of Units Surveyed:	50
Average Unit Dimensions (m):	D 11.7 W 7.6
Average # of Grids Surveyed:	102
Average # of Survey Readings:	107
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	5.2
# Occupied/ Furnished Units:	38
# Unoccupied/ Unfurnished Units:	12
# Units where Tenant Present for Survey:	38
# Units where Tenant Not Present for Survey:	12

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FIGURE 16
FLOORPLAN 7B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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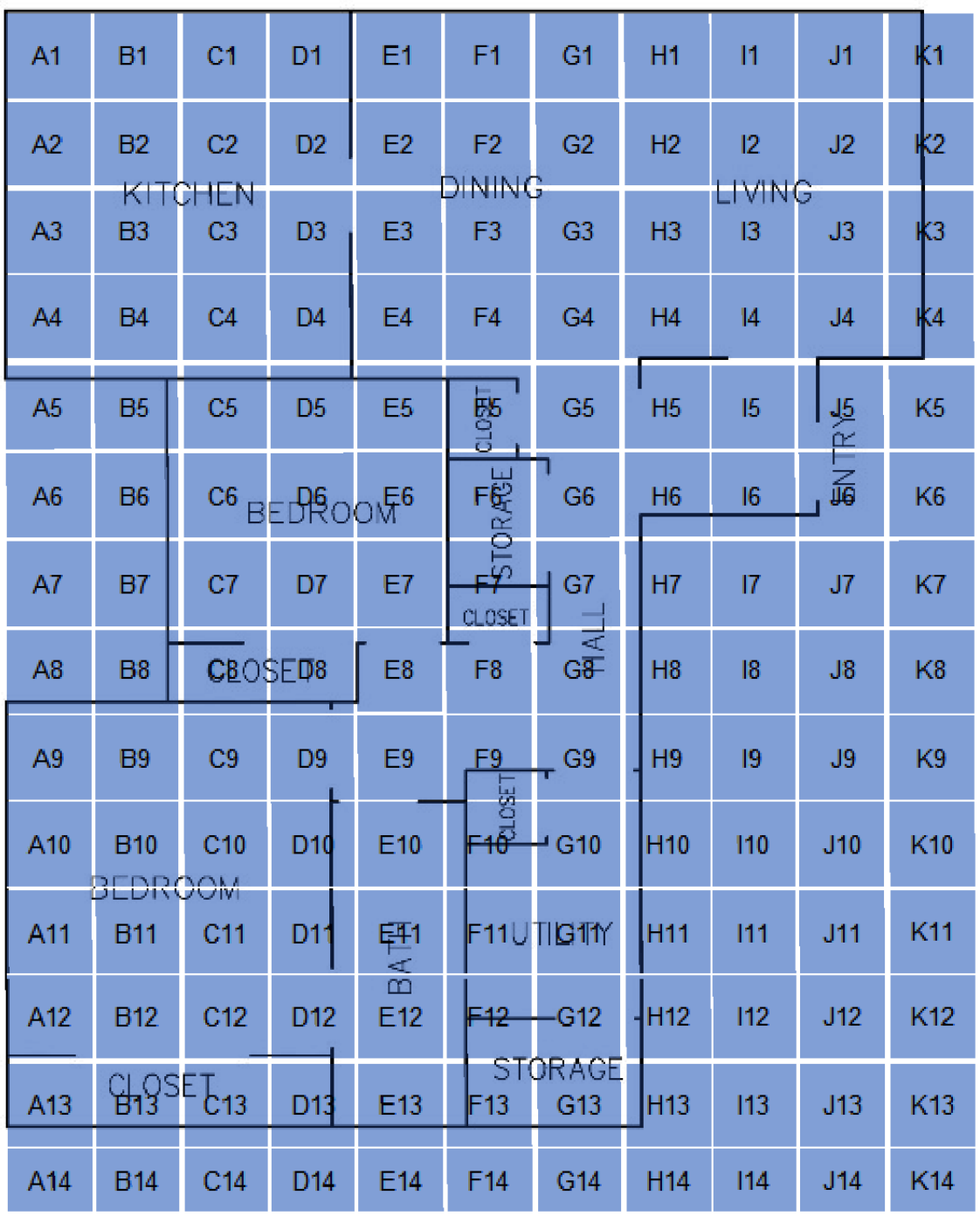

Floor Plan 8 Summary

Number of Units Surveyed:	34
Average Unit Dimensions (m):	D 11.4 W 11.1
Average # of Grids Surveyed:	112
Average # of Survey Readings:	125
Minimum Background Reading (µR/hr):	3.2
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.4
MaximumSurvey Reading (µR/hr):	6.4
# Occupied/ Furnished Units:	26
# Unoccupied/ Unfurnished Units:	8
# Units where Tenant Present for Survey:	24
# Units where Tenant Not Present for Survey:	10

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FIGURE 17
FLOORPLAN 8 SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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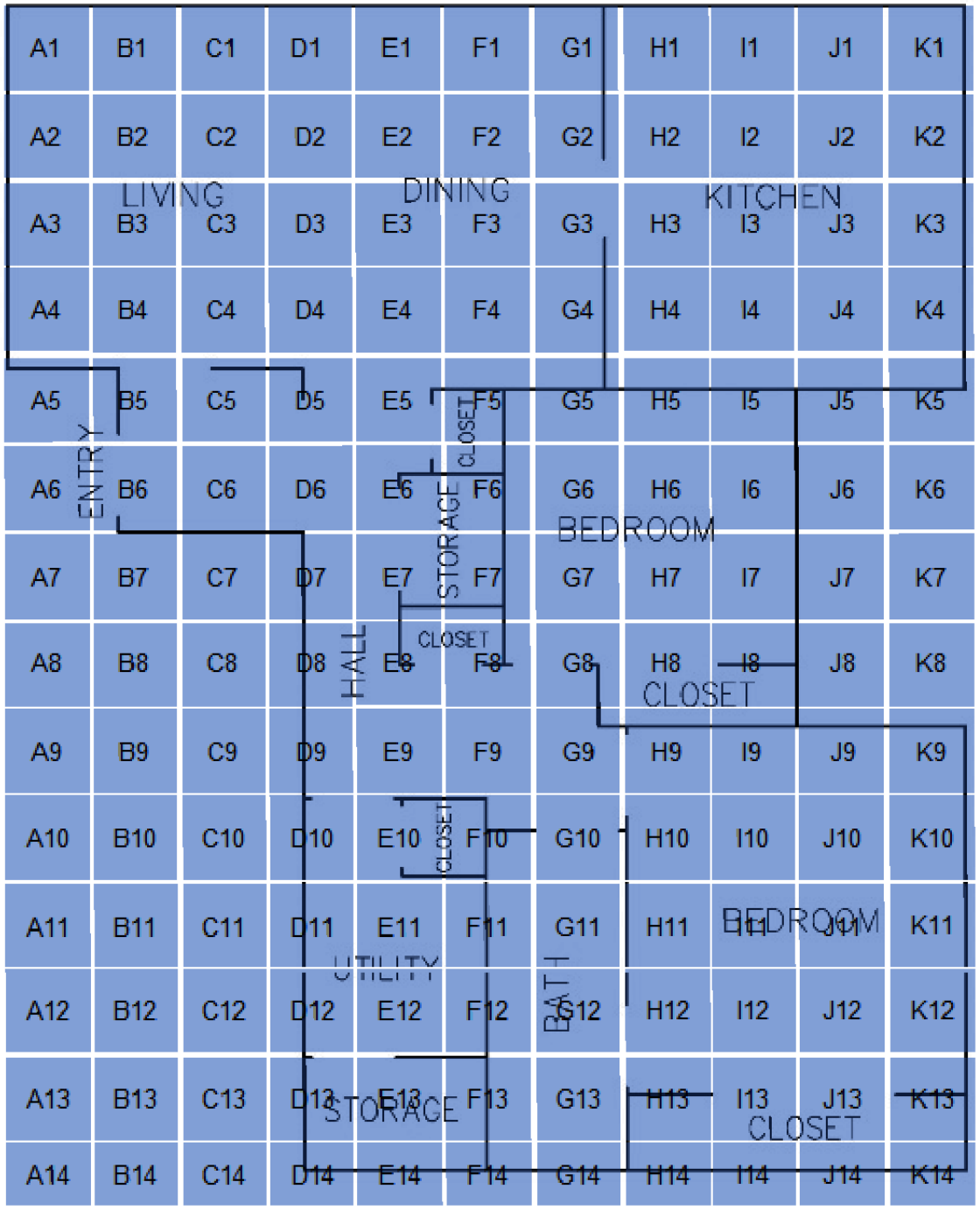

Floor Plan 8B Summary

Number of Units Surveyed:	34
Average Unit Dimensions (m):	D 11.4 W 11.1
Average # of Grids Surveyed:	114
Average # of Survey Readings:	134
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.0
MaximumSurvey Reading (µR/hr):	6.8
# Occupied/ Furnished Units:	17
# Unoccupied/ Unfurnished Units:	17
# Units where Tenant Present for Survey:	17
# Units where Tenant Not Present for Survey:	17

U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 18
FLOORPLAN 8B SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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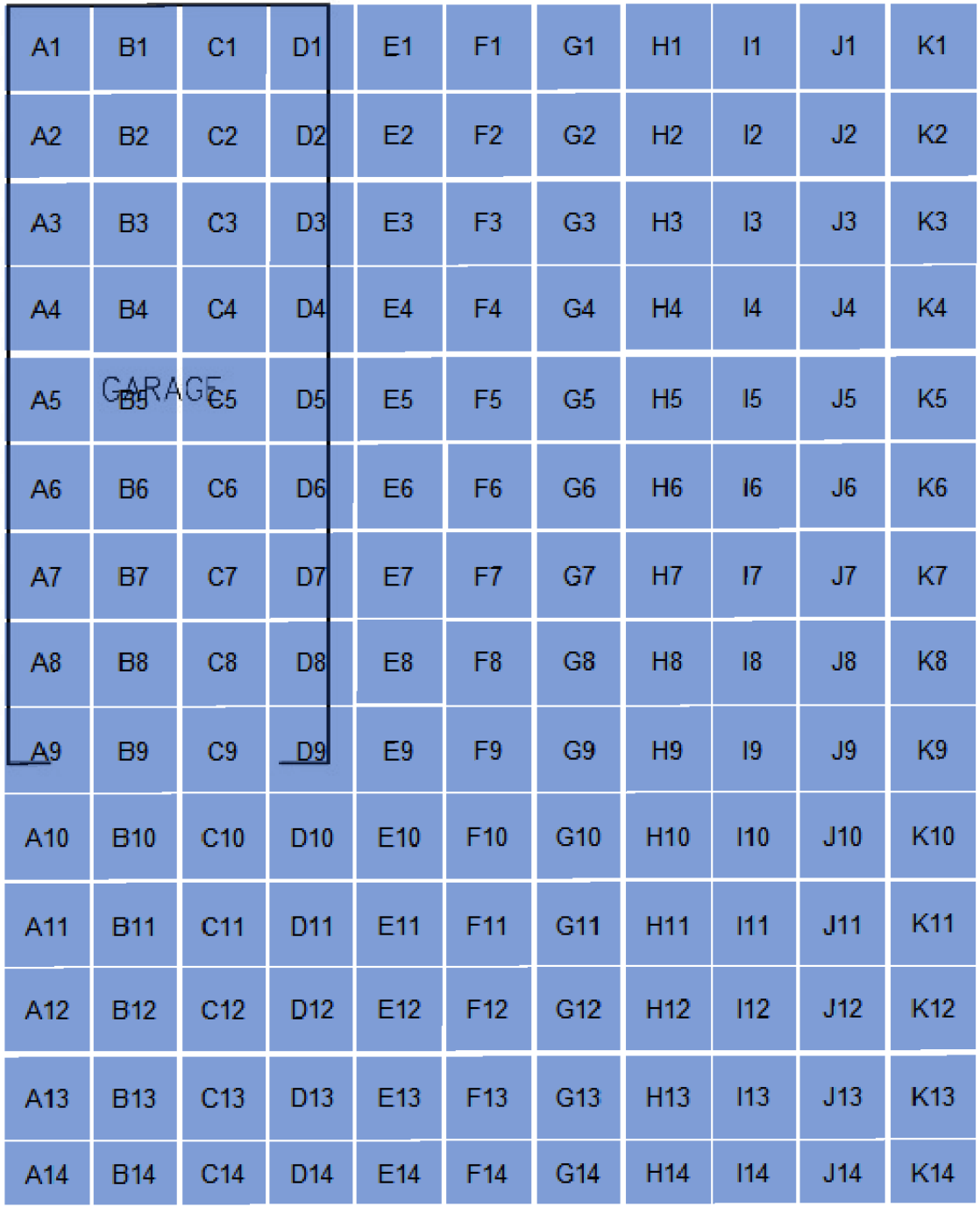

Garage Summary

Number of Units Surveyed:	200
Average Unit Dimensions (m):	D 8.0 W 3.4
Average # of Grids Surveyed:	36
Average # of Survey Readings:	36
Minimum Background Reading (µR/hr):	2.8
Maximum Background Reading (µR/hr):	4.0
Minimum Survey Reading (µR/hr):	2.4
MaximumSurvey Reading (µR/hr):	5.0
# Occupied/ Furnished Units:	144
# Unoccupied/ Unfurnished Units:	56
# Units where Tenant Present for Survey:	77
# Units where Tenant Not Present for Survey:	123

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FIGURE 19
GARAGE SCAN SUMMARY

NAVAL STATION TREASURE ISLAND

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Tables

Table 1
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1100	Halyburton Court	San Francisco, California 94130	Navy Offline
1101	Bigelow Court	San Francisco, California 94130	Navy Offline
1102	Halburton Court	San Francisco, California 94130	Navy Offline
1103	Bigelow Court	San Francisco, California 94130	Navy Offline
1104	Halburton Court	San Francisco, California 94130	Navy Offline
1105	Bigelow Court	San Francisco, California 94130	Navy Offline
1106	Halburton Court	San Francisco, California 94130	Navy Offline
1107	Bigelow Court	San Francisco, California 94130	Navy Offline
1108	Halburton Court	San Francisco, California 94130	The Villages at Treasure Island
1109	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1110	Halburton Court	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1111	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1112	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1113	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1114	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1115	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1116	Hutchins Court	San Francisco, California 94130	CHP—Community Partnership
1117	Keppler Court	San Francisco, California 94130	Rubicon Villages
1118	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1119	Lester Court	San Francisco, California 94130	Navy Offline
1120	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1121	Lester Court	San Francisco, California 94130	Navy Offline
1122	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1123	Lester Court	San Francisco, California 94130	Navy Offline
1124	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1125	Lester Court	San Francisco, California 94130	Navy Offline
1126	Reeves Court	San Francisco, California 94130	CHP—Community Partnership
1127	Lester Court	San Francisco, California 94130	Navy Offline
1128	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1129	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1131	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1133	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1135	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1137	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1139	Ozbourn Court	San Francisco, California 94130	Catholic Charities

Table 1 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1141	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1143	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1145	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1147	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1149	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1201	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1202	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1203	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1204	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1205	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1206	Mariner Drive	San Francisco, California 94130	Catholic Charities
1207	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1208	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1209	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1210	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1211	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1212	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1213	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1420 (Previously 1214)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island
1215	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1430 (Previously 1216)	Gateview Court	San Francisco, California 94130	CHP—Community Partnership
1217	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1440 (Previously 1218)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island
1219	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1220	Bayside Drive	San Francisco, California 94130	Catholic Charities
1221	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1222	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1223	Mariner Drive	San Francisco, California 94130	CHP—Community Partnership
1224	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1225	Northpoint Drive	San Francisco, California 94130	Healthright 360
1226	Bayside Drive	San Francisco, California 94130	CHP—Community Partnership
1227	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1390 (Previously 1228)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island

Table 1 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1229	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1394 (Previously 1230)	Gateview Court	San Francisco, California 94130	CHP—Community Partnership
1231	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1232	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1233	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1234	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1235	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1236	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1237	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1238	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1239	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1240	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1241	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1242	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1243	Northpoint Drive	San Francisco, California 94130	CHP—Community Partnership
1244	Northpoint Drive	San Francisco, California 94130	Catholic Charities
1245	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1397 (Previously 1246)	Gateview Court	San Francisco, California 94130	Rubicon Villages
1247	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1395 (Previously 1248)	Gateview Court	San Francisco, California 94130	Rubicon Villages
1249	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1250	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1251	Exposition Drive	San Francisco, California 94130	Catholic Charities
1252	Exposition Drive	San Francisco, California 94130	Rubicon Villages
1253	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
625 (Previously 1254)	13th Street	San Francisco, California 94130	Healthright 360
1301	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
905 (Previously 1302)	Avenue B	San Francisco, California 94130	The Villages at Treasure Island
1303	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
901 (Previously 1304)	Avenue B	San Francisco, California 94130	The Villages at Treasure Island
1305	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1306	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island

Table 1 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1307	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1308	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1309	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1310	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1311	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1312	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1313	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1314	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1315	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1316	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1317	Gateview Avenue	San Francisco, California 94130	Navy Offline
1318	Gateview Avenue	San Francisco, California 94130	Healthright 360
1319	Westside Drive	San Francisco, California 94130	Navy Offline
1321	Westside Drive	San Francisco, California 94130	Navy Offline
1323	Westside Drive	San Francisco, California 94130	Navy Offline
1325	Westside Drive	San Francisco, California 94130	The Villages at Treasure Island & Navy Offline
1400	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1401	Sturgeon Street	San Francisco, California 94130	CHP—Community Partnership
1402	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1403	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1404	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1405	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1406	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1408	Sturgeon Street	San Francisco, California 94130	Rubicon Villages
1409	Flounder Court	San Francisco, California 94130	Catholic Charities
1410	Flounder Court	San Francisco, California 94130	Rubicon Villages
1411	Flounder Court	San Francisco, California 94130	CHP—Community Partnership
1412	Flounder Court	San Francisco, California 94130	Rubicon Villages
1413	Flounder Court	San Francisco, California 94130	CHP—Community Partnership
1418	Striped Bass Street	San Francisco, California 94130	The Villages at Treasure Island
1419	Striped Bass Street	San Francisco, California 94130	Catholic Charities
1420	Striped Bass Street	San Francisco, California 94130	The Villages at Treasure Island
1430	Halibut Court	San Francisco, California 94130	The Villages at Treasure Island
1431	Halibut Court	San Francisco, California 94130	The Villages at Treasure Island
1432	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1433	Halibut Court	San Francisco, California 94130	Swords to Plowshares

Table 1 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

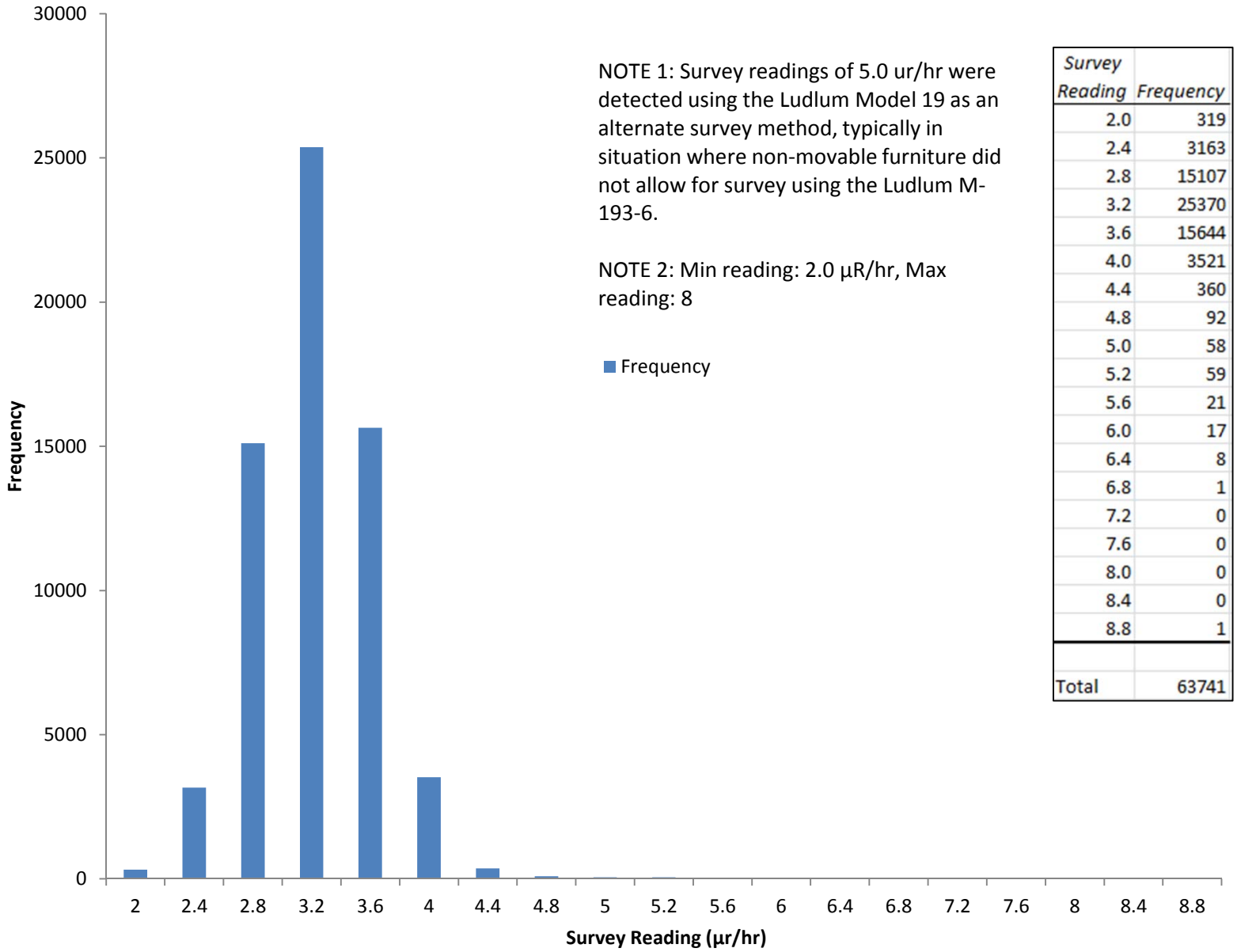
Unit No.	Street	Cite, State, Zip	Housing Providers
1434	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1435	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1436	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1437	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1438	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1439	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1440	Chinook Court	San Francisco, California 94130	Healthright 360
1441	Chinook Court	San Francisco, California 94130	Swords to Plowshares
1442	Chinook Court	San Francisco, California 94130	Healthright 360
1443	Chinook Court	San Francisco, California 94130	Swords to Plowshares
1444	Croaker Court	San Francisco, California 94130	The Villages at Treasure Island
1445	Chinook Court	San Francisco, California 94130	Healthright 360
1447	Chinook Court	San Francisco, California 94130	Healthright 360
1449	Croaker Court	San Francisco, California 94130	The Villages at Treasure Island

Notes:

Gray cells indicate Navy off line (i.e., buildings that are not subject to current or future residential occupancy due to pending demolition or other activity).

Navy U.S. Department of the Navy

Table 2: Summary Count of Survey Readings



NOTE 1: Survey readings of 5.0 ur/hr were detected using the Ludlum Model 19 as an alternate survey method, typically in situation where non-movable furniture did not allow for survey using the Ludlum M-193-6.

NOTE 2: Min reading: 2.0 µR/hr, Max reading: 8

Survey Reading	*Frequency*
2.0	319
2.4	3163
2.8	15107
3.2	25370
3.6	15644
4.0	3521
4.4	360
4.8	92
5.0	58
5.2	59
5.6	21
6.0	17
6.4	8
6.8	1
7.2	0
7.6	0
8.0	0
8.4	0
8.8	1
Total	63741

TABLE 3: OVERVIEW OF SURVEY RESULTS

Floor Plan	Number Of Units	Total # of Survey Readings Collected	Average # of Survey Readings Collected	Maximum Background	Minimum Background	Maximum Reading[(1)]	Minimum Reading	Furnished		Tenant Present	
								Yes	No	Yes	No
Floor Plan 1	8	637	80	3.6	2.8	4.0	2.0	7	1	7	1
Floor Plan 1B	8	594	74	3.6	2.8	4.0	2.0	8	0	8	0
Floor Plan 2	55	4788	87	3.6	2.4	6.0	2.0	45	10	42	13
Floor Plan 2B	55	4523	82	3.6	2.4	5.0	2.0	45	10	45	10
Floor Plan 3	12	1059	88	3.6	2.8	4.8	2.0	8	4	7	5
Floor Plan 3B	12	1096	91	4.0	2.8	4.4	2.0	10	2	10	2
Floor Plan 4	23	1938	84	3.6	2.8	6.0	2.0	21	2	19	4
Floor Plan 4B	23	2226	97	4.0	2.8	5.2	2.0	19	4	19	4
Floor Plan 5	79	6311	80	4.0	2.8	5.6	2.0	65	14	63	16
Floor Plan 5B	79	7057	89	3.6	2.4	5.2	2.0	67	12	60	19
Floor Plan 6	36	3308	92	4.0	2.8	5.0	2.0	25	11	23	13
Floor Plan 6B	36	3434	95	3.6	2.8	6.0	2.0	29	7	28	8
Floor Plan 7	50	5453	109	3.6	2.8	8.8	2.0	32	18	30	20
Floor Plan 7B	50	5357	107	4.0	2.8	5.2	2.0	38	12	38	12
Floor Plan 8	34	4238	125	4.0	3.2	6.4	2.4	26	8	24	10
Floor Plan 8B	34	4545	134	4.0	2.8	6.8	2.0	17	17	17	17
Garage	200	7177	36	4.0	2.8	5.0	2.4	144	56	77	123
Totals:	**794**	**63741**						**606**	**188**	**517**	**277**

Footnotes:

(i) Maximum readings of 5.0 µR/hr were detected using the Ludlum Model 19 as an alternative survey method. Typically in a situation where non-movable furniture did not allow for sufficient space for a survey using the Ludlum M-193-6.

Table 4
Summary of Elevated Measurements

Location	Background Reading (µR/hr)	Survey Measurement Maximum Contact (µR/hr)	Survey Measurement Used for Assessment Gross/Net Measurement at 12 Inches (µR/hr)	Conclusion/Recommendation
1303-F: Hallway near kitchen	3.6	20	8.8 / 5.2	Object does not present a significant health issue. The housing unit is unoccupied. Future investigation is warranted. Recommend to remove object. (Annual dose calculation: 5.5 millirems per year (mrem/yr) based on an occupancy factor of 3 hours per day for 365 days per year).
1240-D: 3 inches horizontally from wall in corner of living room	3.2	16.0	6.0 / 2.8	Object does not present a significant health issue. The housing unit is occupied. Future investigation is warranted. Recommend to remove object. (Annual dose calculation: 2.9 mrem/yr based on an occupancy factor of 3 hours per day for 350 days per year).
1241-B: Exterior storage shed	3.2	12	4.8 / 1.6	Object does not present a significant health issue. The storage shed is unoccupied, but in use by occupants. Future investigation is warranted. Recommend to remove object. (Annual dose calculation: 1.7 mrem/yr based on an occupancy factor of 3 hours per day for 350 days per year).

Notes:

µR/hr *microroentgen per hour*

Table 5
Summary of Identified Naturally-Occurring Radioactive Building Materials

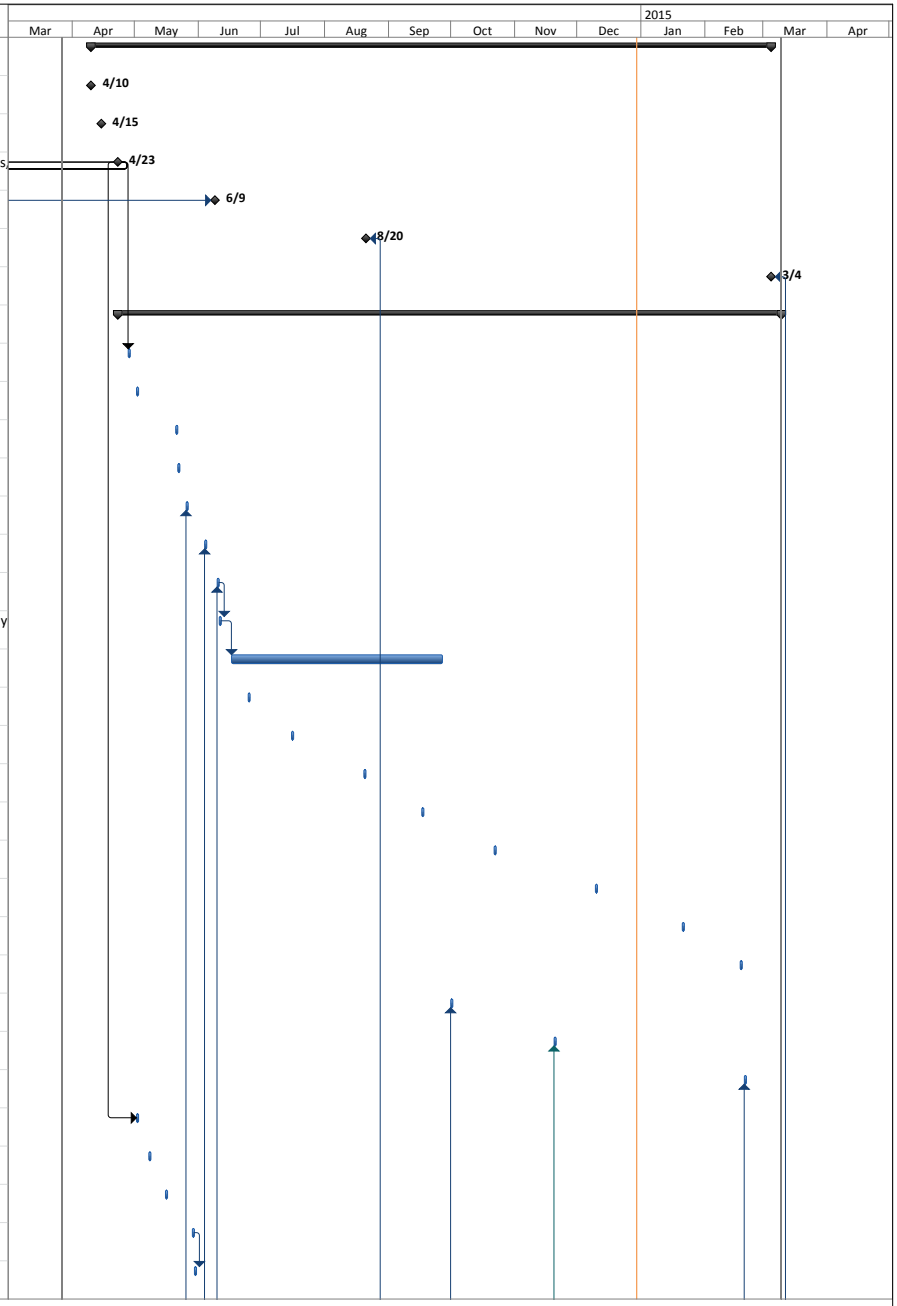
Location and Material	Housing Unit Background Measurement (µR/hr)	Survey Measurement Maximum Contact (µR/hr)	Conclusion/Recommendation
All Units: Tiled shower corners and toilets in bathroom	2.8 to 4.0 µR/hr	Max reading range: 6.4 to 6.8 µR/hr	Bathroom tile and toilet contain naturally occurring radioactive material. Objects or level of natural activity is not of health concern.
1400 Units and Garages: Brick façade	2.8 to 4.0 µR/hr	Max reading range: 5.0 to 6.8 µR/hr	Brick contains naturally occurring radioactive material. Object or level of natural activity is not of health concern.

Notes:

µR/hr *microroentgen per hour*

Appendix A
Project Schedule

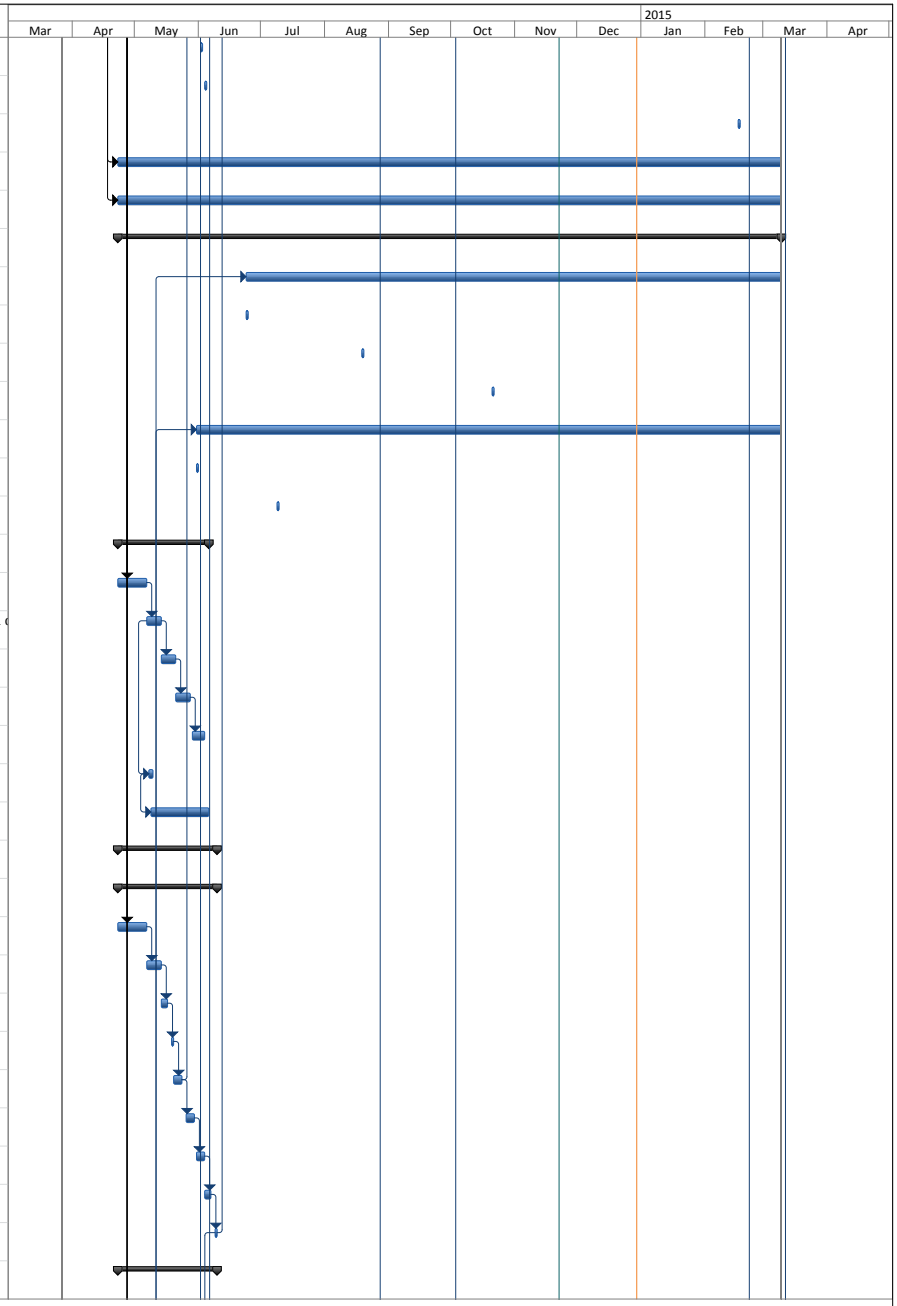
ID	Task Name	Duration	Start	Finish	Predecessors	Successors
1	**Project Milestones**	**235 days**	**Thu 4/10/14**	**Wed 3/4/15**		
2	Proposal Submittal	0 days	Thu 4/10/14	Thu 4/10/14		
3	Revised Submittal Rev1	0 days	Tue 4/15/14	Tue 4/15/14		
4	Project Award	0 days	Wed 4/23/14	Wed 4/23/14		9FS+3 days
5	Field Mobilization	0 days	Mon 6/9/14	Mon 6/9/14	94SS	
6	Field Demobilization	0 days	Wed 8/20/14	Wed 8/20/14	95FF	
7	Project Completion	0 days	Wed 3/4/15	Wed 3/4/15	144FF	
8	**WORK ELEMENT 1 – MEETINGS, PROJECT MANAGEMENT, AND ADMINISTRATIVE**	**229 days**	**Wed 4/23/14**	**Mon 3/9/15**		
9	Project Kick-off Meeting	1 day	Mon 4/28/14	Mon 4/28/14	4FS+3 days	
10	Internal Meeting on Task Specific Plan	1 day	Fri 5/2/14	Fri 5/2/14		
11	**BCT Meeting #1**	**1 day**	**Wed 5/21/14**	**Wed 5/21/14**		
12	**Navy/TIDA/CB&I walkthrough 1400 series garages**	**1 day**	**Thu 5/22/14**	**Thu 5/22/14**		
13	External Meeting on Task Specific Plan	1 day	Mon 5/26/14	Mon 5/26/14	61	
14	Meeting on resolving Response to Comments with CDPH	1 day	Wed 6/4/14	Wed 6/4/14	73	
15	Orientation Session CB&I/Navy	1 day	Tue 6/10/14	Tue 6/10/14	65	16
16	Survey Kick-off Meeting	1 day	Wed 6/11/14	Wed 6/11/14	15	17FS+3 day
17	Meetings as necessary during fieldwork, including weekly QC meetings.	73 days	Tue 6/17/14	Fri 9/26/14	16FS+3 days	
18	**BCT Meeting #2**	**1 day**	**Wed 6/25/14**	**Wed 6/25/14**		
19	**BCT Meeting #3**	**1 day**	**Wed 7/16/14**	**Wed 7/16/14**		
20	**BCT Meeting #4**	**1 day**	**Wed 8/20/14**	**Wed 8/20/14**		
21	BCT Meeting	1 day	Wed 9/17/14	Wed 9/17/14		
22	BCT Meeting	1 day	Wed 10/22/14	Wed 10/22/14		
23	BCT Meeting	1 day	Wed 12/10/14	Wed 12/10/14		
24	BCT Meeting	1 day	Wed 1/21/15	Wed 1/21/15		
25	BCT Meeting	1 day	Wed 2/18/15	Wed 2/18/15		
26	Internal Meeting to present Survey Report to the Navy (pending)	1 day	Wed 10/1/14	Wed 10/1/14	132	
27	External Meeting to present Survey Report to the regulators (pending)	1 day	Thu 11/20/14	Thu 11/20/14	136	
28	Meeting to resolve Responses to Comments on the Survey Report	1 day	Fri 2/20/15	Fri 2/20/15	142	
29	**Routine Meeting #1**	**1 day**	**Fri 5/2/14**	**Fri 5/2/14**	**4SS**	
30	**Routine Meeting #2**	**1 day**	**Thu 5/8/14**	**Thu 5/8/14**		
31	**Routine Meeting #3**	**1 day**	**Fri 5/16/14**	**Fri 5/16/14**		
32	**Routine Meeting #4**	**1 day**	**Thu 5/29/14**	**Thu 5/29/14**		**33**
33	**Routine Meeting #5**	**1 day**	**Fri 5/30/14**	**Fri 5/30/14**	**32**	



Project: 2014 CTO 005 EMAC III R
Date: Tue 12/30/14
Appendix A

Task | Split | Milestone | Summary | Project Summary | External Tasks | External Milestone | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | Deadline | Progress

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
34	**Routine Meeting #6**	**1 day**	**Mon 6/2/14**	**Mon 6/2/14**		
35	**Routine Meeting #7**	**1 day**	**Wed 6/4/14**	**Wed 6/4/14**		
36	Routine Meeting (pending)	1 day	Tue 2/17/15	Tue 2/17/15		
37	Project Management and Administrative Support	229 days	Wed 4/23/14	Mon 3/9/15	4SS	
38	Project Schedule	229 days	Wed 4/23/14	Mon 3/9/15	4SS	
39	**WORK ELEMENT 2 – COMMUNITY OUTREACH SUPPORT**	**229 days**	**Wed 4/23/14**	**Mon 3/9/15**		
40	RAB Meetings 1-4	184 days	Tue 6/24/14	Mon 3/9/15	69SS	
41	**TI RAB #1**	**1 day**	**Tue 6/24/14**	**Tue 6/24/14**		
42	**TI RAB #2**	**1 day**	**Tue 8/19/14**	**Tue 8/19/14**		
43	**TI RAB #3**	**1 day**	**Tue 10/21/14**	**Tue 10/21/14**		
44	Public Meetings 1-2	201 days	Sat 5/31/14	Mon 3/9/15	69SS	
45	**TI Open House #1**	**1 day**	**Sat 5/31/14**	**Sat 5/31/14**		
46	**TIDA Board Meeting #2**	**1 day**	**Wed 7/9/14**	**Wed 7/9/14**		
47	**Fact Sheet and Work Notice**	**33 days**	**Wed 4/23/14**	**Thu 6/5/14**		
48	Draft Fact Sheet and Work Notice	10 days	Wed 4/23/14	Tue 5/6/14	4	49
49	Navy Review of Draft Fact Sheet and Work Notice	5 days	Wed 5/7/14	Tue 5/13/14	48	50,53SS+1 d
50	RTCs on Draft Fact Sheet and Work Notice and Issue Internal Final	5 days	Wed 5/14/14	Tue 5/20/14	49	51
51	Navy Review of RTCs/Internal Final	5 days	Wed 5/21/14	Tue 5/27/14	50	52
52	Finalize RTCs and Produce the Final Fact Sheet and Work Notice	5 days	Thu 5/29/14	Tue 6/3/14	51	
53	Reconnaissance & Survey	2 days	Thu 5/8/14	Fri 5/9/14	49SS+1 day	54SS
54	Report Card/Survey Receipt	21 days	Fri 5/9/14	Thu 6/5/14	53SS	
55	**WORK ELEMENT 3 – PROJECT PLANS**	**35 days**	**Wed 4/23/14**	**Mon 6/9/14**		
56	**Task Specific Plan (TSP)**	**35 days**	**Wed 4/23/14**	**Mon 6/9/14**		
57	Internal Draft TSP	10 days	Wed 4/23/14	Tue 5/6/14	4	58
58	Navy Review of Internal Draft TSP	5 days	Wed 5/7/14	Tue 5/13/14	57	59
59	Response to Comments (RTCs) on Internal Draft TSP	3 days	Wed 5/14/14	Fri 5/16/14	58	60
60	Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	59	61
61	Finalize RTCs and Issue Draft TSP	4 days	Tue 5/20/14	Fri 5/23/14	60	62,13
62	Agency Review of Draft TSP	4 days	Mon 5/26/14	Thu 5/29/14	61	63
63	Response to Comments (RTCs) on Draft	3 days	Sat 5/31/14	Tue 6/3/14	62	64
64	Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	63	65
65	Finalize RTCs and Issue Final TSP	1 day	Mon 6/9/14	Mon 6/9/14	64	15,94SS
66	**Data Management Plan**	**35 days**	**Wed 4/23/14**	**Mon 6/9/14**		



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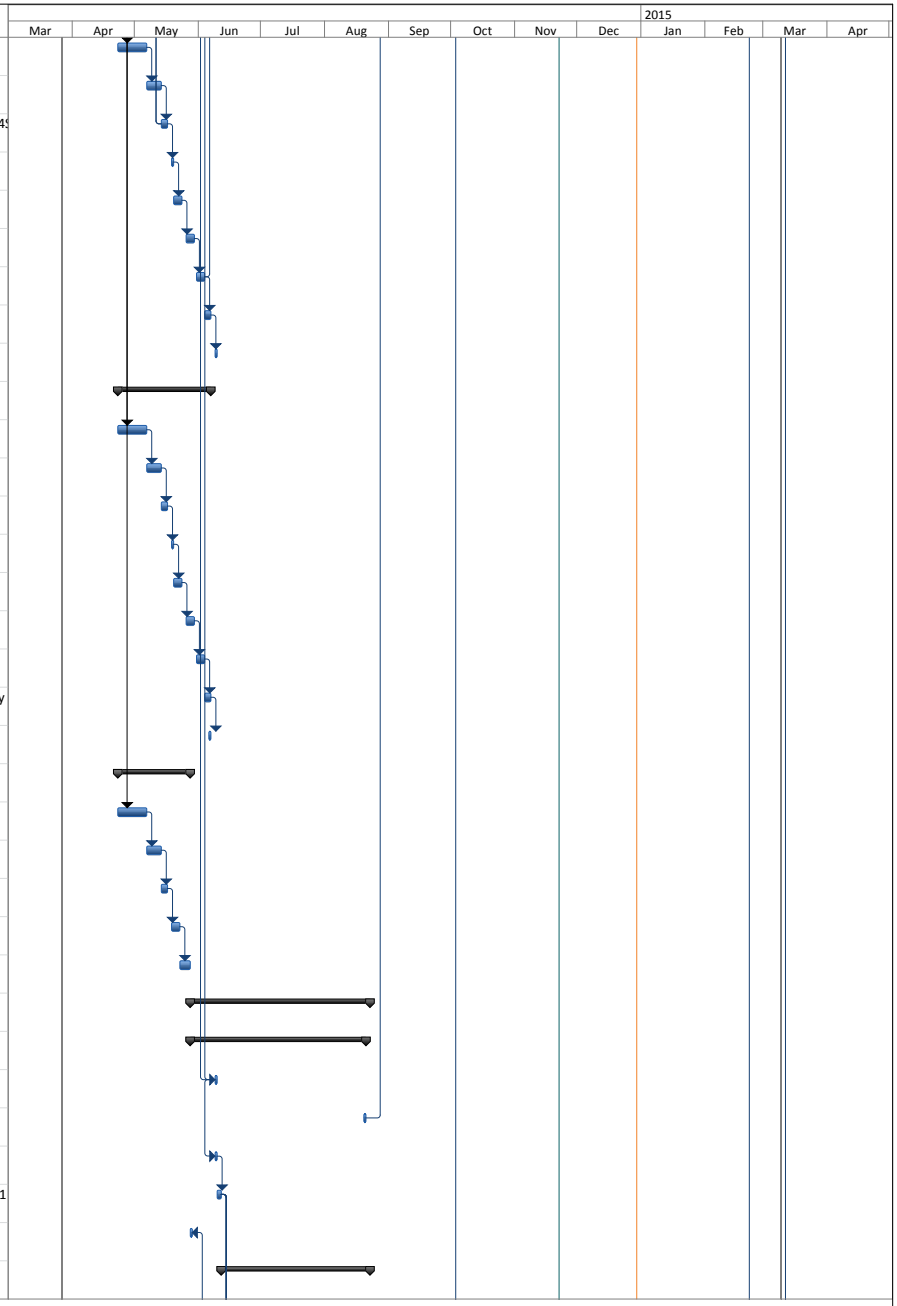
Appendix A

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
67	Internal Draft Data Management Plan	10 days	Wed 4/23/14	Tue 5/6/14	4	68
68	Navy Review of Internal Draft Data Management Plan	5 days	Wed 5/7/14	Tue 5/13/14	67	69
69	Response to Comments (RTCs) on Internal Draft Data Management Plan	3 days	Wed 5/14/14	Fri 5/16/14	68	70,40SS,44
70	Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	69	71
71	Finalize RTCs and Issue Draft Data Management Plan	4 days	Tue 5/20/14	Fri 5/23/14	70	72
72	Agency Review of Draft Data Management Plan	4 days	Mon 5/26/14	Thu 5/29/14	71	73
73	Response to Comments (RTCs) on Draft	3 days	Sat 5/31/14	Tue 6/3/14	72	74,14
74	Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	73	75
75	Finalize RTCs and Issue Final Data Management Plan	1 day	Mon 6/9/14	Mon 6/9/14	74	
76	**Contractor Quality Control Plan (CQC)**	**34 days**	**Wed 4/23/14**	**Fri 6/6/14**		
77	Internal Draft CQC	10 days	Wed 4/23/14	Tue 5/6/14	4	78
78	Navy Review of Internal Draft CQC	5 days	Wed 5/7/14	Tue 5/13/14	77	79
79	Response to Comments (RTCs) on Internal Draft CQC	3 days	Wed 5/14/14	Fri 5/16/14	78	80
80	Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	79	81
81	Finalize RTCs and Issue Draft CQC	4 days	Tue 5/20/14	Fri 5/23/14	80	82
82	Agency Review of Draft CQC	4 days	Mon 5/26/14	Thu 5/29/14	81	83
83	Response to Comments (RTCs) on Draft	3 days	Sat 5/31/14	Tue 6/3/14	82	84
84	Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	83	85FS-1 day
85	Finalize RTCs and Issue Final CQC	1 day	Fri 6/6/14	Fri 6/6/14	84FS-1 day	
86	**Health and Safety Plan (HSP)**	**25 days**	**Wed 4/23/14**	**Tue 5/27/14**		
87	Internal Draft HSP	10 days	Wed 4/23/14	Tue 5/6/14	4	88
88	Navy Review of Internal Draft HSP	5 days	Wed 5/7/14	Tue 5/13/14	87	89
89	Response to Comments (RTCs) on Internal Draft HSP	3 days	Wed 5/14/14	Fri 5/16/14	88	90
90	Navy Review of RTCs	4 days	Mon 5/19/14	Thu 5/22/14	89	91
91	Finalize RTCs and Issue Final HSP	3 days	Fri 5/23/14	Tue 5/27/14	90	
92	**WORK ELEMENT 4 – FIELD WORK**	**64 days**	**Wed 5/28/14**	**Fri 8/22/14**		
93	**Mobilization and Demobilization**	**62 days**	**Wed 5/28/14**	**Wed 8/20/14**		
94	Mobilization	1 day	Mon 6/9/14	Mon 6/9/14	65SS	5SS,96SS
95	Demobilization	1 day	Wed 8/20/14	Wed 8/20/14		6FF
96	New Hire Orientation/Training	1 day	Mon 6/9/14	Mon 6/9/14	94SS	97
97	Task Specific Training	2 days	Tue 6/10/14	Wed 6/11/14	96	103,107,11
98	Distribute First Work Notice	1 day	Wed 5/28/14	Wed 5/28/14	103SF-14 day	
99	**Site Maintenance**	**52 days**	**Thu 6/12/14**	**Fri 8/22/14**		



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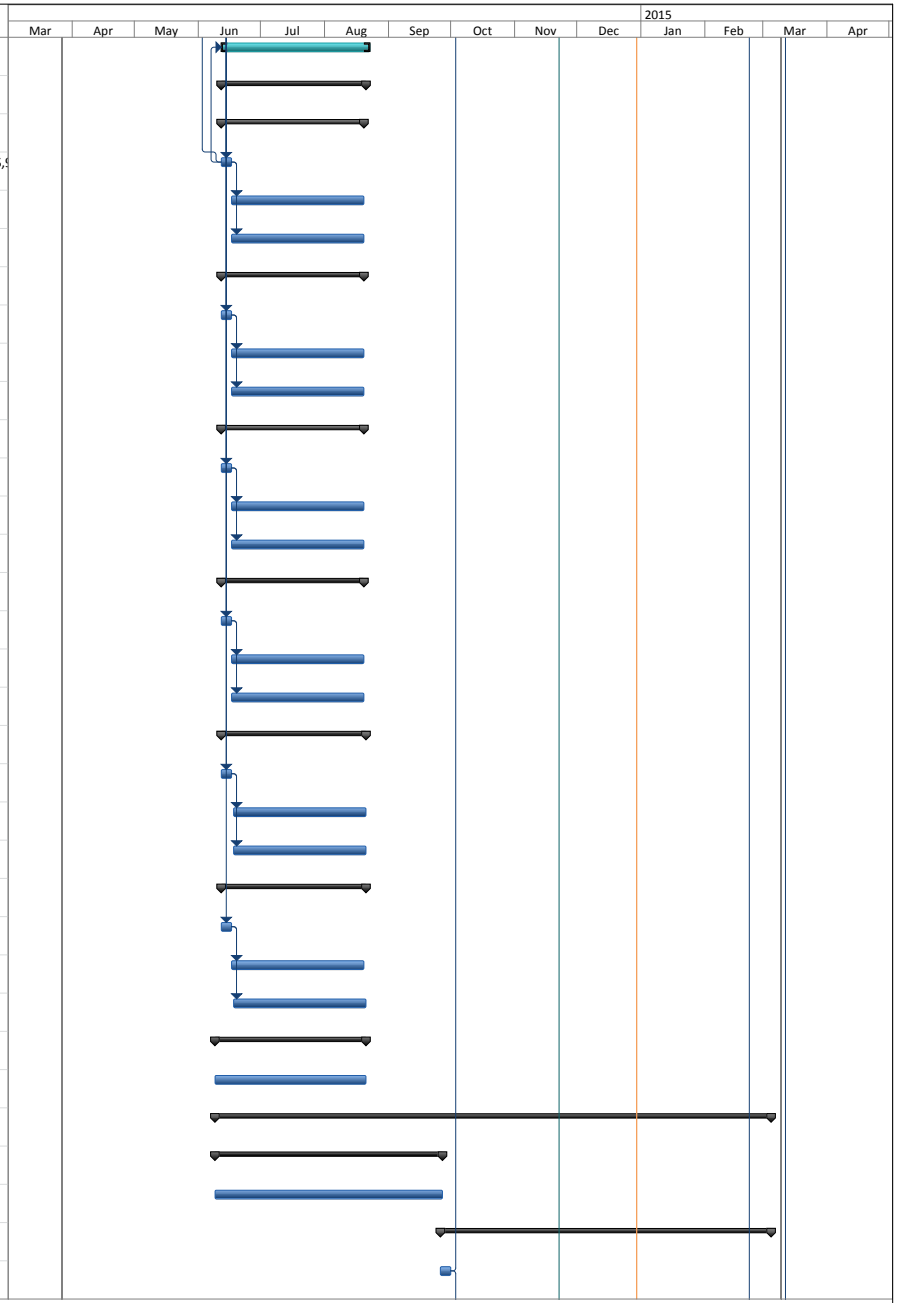
ID	Task Name	Duration	Start	Finish	Predecessors	Successors
100	Ongoing Site Maintenance	52 days	Thu 6/12/14	Fri 8/22/14	103SS	
101	**Site Work**	**50 days**	**Thu 6/12/14**	**Wed 8/20/14**		
102	**Team 1**	**49 days**	**Thu 6/12/14**	**Tue 8/19/14**		
103	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	104,100SS,9
104	Removal of Furniture	46 days	Tue 6/17/14	Tue 8/19/14	103	
105	Radiological Scoping Surveys	46 days	Tue 6/17/14	Tue 8/19/14	103	
106	**Team 2**	**49 days**	**Thu 6/12/14**	**Tue 8/19/14**		
107	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	108,109
108	Removal of Furniture	46 days	Tue 6/17/14	Tue 8/19/14	107	
109	Radiological Scoping Surveys	46 days	Tue 6/17/14	Tue 8/19/14	107	
110	**Team 3**	**49 days**	**Thu 6/12/14**	**Tue 8/19/14**		
111	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	112,113
112	Removal of Furniture	46 days	Tue 6/17/14	Tue 8/19/14	111	
113	Radiological Scoping Surveys	46 days	Tue 6/17/14	Tue 8/19/14	111	
114	**Team 4**	**49 days**	**Thu 6/12/14**	**Tue 8/19/14**		
115	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	116,117
116	Removal of Furniture	46 days	Tue 6/17/14	Tue 8/19/14	115	
117	Radiological Scoping Surveys	46 days	Tue 6/17/14	Tue 8/19/14	115	
118	**Team 5**	**50 days**	**Thu 6/12/14**	**Wed 8/20/14**		
119	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	120,121
120	Removal of Furniture	46 days	Wed 6/18/14	Wed 8/20/14	119	
121	Radiological Scoping Surveys	46 days	Wed 6/18/14	Wed 8/20/14	119	
122	**Team 6**	**50 days**	**Thu 6/12/14**	**Wed 8/20/14**		
123	Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	97	124,125
124	Removal of Furniture	46 days	Tue 6/17/14	Tue 8/19/14	123	
125	Radiological Scoping Surveys	46 days	Wed 6/18/14	Wed 8/20/14	123	
126	**Field Work Reports and QC Meetings**	**53 days**	**Mon 6/9/14**	**Wed 8/20/14**		
127	Ongoing Field Work Reports and Status Meetings	53 days	Mon 6/9/14	Wed 8/20/14		
128	**WORK ELEMENT 5 – DATA ANALYSIS AND SURVEY COMPLETION REPORT**	**192 days**	**Mon 6/9/14**	**Wed 3/4/15**		
129	**Data Analysis**	**79 days**	**Mon 6/9/14**	**Fri 9/26/14**		
130	Data Analysis	79 days	Mon 6/9/14	Fri 9/26/14		
131	**Survey Completion Report**	**114 days**	**Fri 9/26/14**	**Wed 3/4/15**		
132	Internal Draft Survey Completion Report	3 days	Fri 9/26/14	Tue 9/30/14		133,26



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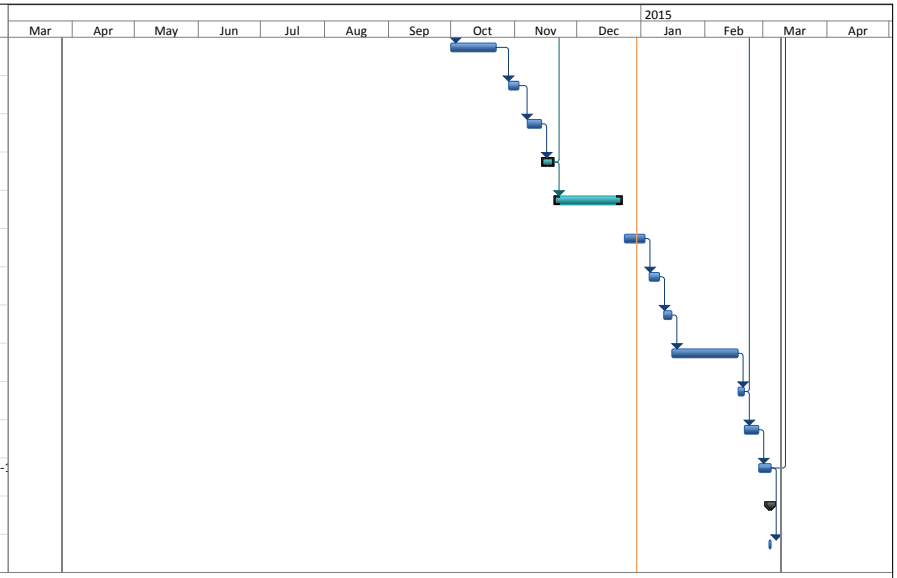
Task | Summary | External Milestone | Inactive Summary | Manual Summary Rollup | Finish-only
Split | Project Summary | Inactive Task | Manual Task | Manual Summary | Deadline
Milestone | External Tasks | Inactive Milestone | Duration-only | Start-only | Progress

ID	Task Name	Duration	Start	Finish	Predecessors	Successors
133	Navy Review of Internal Draft Survey Completion Report	16 days	Wed 10/1/14	Wed 10/22/14	132	134
134	Response to Comments (RTCs) on Internal Draft Survey Completion Report	3 days	Wed 10/29/14	Sun 11/2/14	133	135
135	Navy Review of RTCs	5 days	Fri 11/7/14	Thu 11/13/14	134	136
136	Finalize RTCs and Issue Draft Survey Completion Report	4 days	Fri 11/14/14	Wed 11/19/14	135	137,27
137	Agency Review of Draft Survey Completion Report	23 days	Thu 11/20/14	Mon 12/22/14	136	
138	Response to Comments (RTCs) - Agency/RAB Comments	8 days	Wed 12/24/14	Fri 1/2/15		139
139	Navy Review of RTCs	5 days	Mon 1/5/15	Fri 1/9/15	138	140
140	Finalize RTCs and Issue Draft Final Survey Completion Report	4 days	Mon 1/12/15	Thu 1/15/15	139	141
141	Agency Review of Draft Final Survey Completion Report	22 days	Fri 1/16/15	Mon 2/16/15	140	142
142	Response to Comments (RTCs) - Agency/RAB Comments	3 days	Tue 2/17/15	Thu 2/19/15	141	143,28
143	Navy/Agency Review of RTCs	5 days	Fri 2/20/15	Thu 2/26/15	142	144
144	Finalize RTCs and Issue Final Survey Completion Report	4 days	Fri 2/27/15	Wed 3/4/15	143	7FF,146FS-1
145	**Records Management**	**1 day**	**Wed 3/4/15**	**Wed 3/4/15**		
146	Submit all documentation	1 day	Wed 3/4/15	Wed 3/4/15	144FS-1 day	



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Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Deadline
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Progress

Appendix B
Final Task-Specific Plan
(DCN: CBI-2005-0005-0003; dated June 2014)

FINAL
TASK-SPECIFIC PLAN
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units Former Naval Station Treasure Island San Francisco, California

Contract Number: N62473-12-D-2005
Contract Task Order: 0005

Document Control Number: CBI-2005-0005-0003

June 2014

Submitted to:

Base Realignment and Closure
Program Management Office West Naval Facilities Engineering Command
1455 Frazee Road, Suite 900
San Diego, California 92108

Submitted by:

CB&I Federal Services LLC
4005 Port Chicago Highway, Suite 200
Concord, California 94520-1120

FINAL
TASK-SPECIFIC PLAN
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units Former Naval Station Treasure Island San Francisco, California

Contract Number: N62473-12-D-2005
Contract Task Order: 0005

Document Control Number: CBI-2005-0005-0003

June 2014

Prepared by: _____ Date: June 6, 2014
John Hackett, PE, CHP, PMP
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Prepared by: _____ Date: June 6, 2014
Raymond Schul
Project Radiation Safety Officer

Approved by: _____ Date: June 6, 2014
Ulrika T. Messer, PE
Project Manager

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Acronyms and Abbreviations

µR/hr	microroentgen per hour
193-6	Ludlum Model 193-6 survey meter
APP/SSHP	*Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*
BCT	Base Realignment and Closure Cleanup Team
CB&I	CB&I Federal Services LLC
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act of 1980
cpm	count per minute
CTO	contract task order
DTSC	California Department of Toxic Substance Control
HHRA	human health risk assessment
IR	Installation Restoration
MoU	Memorandum of Understanding
Navy	U.S. Department of the Navy
NSTI	former Naval Station Treasure Island
PDT	pacific daylight time
RASO	Radiological Affairs Support Office
RCT	radiological control technician
ROICC	Resident Officer in Charge of Construction
Sitewide RPP	*Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California*
TI	Treasure Island
TIDA	Treasure Island Development Authority
TSP	task-specific plan
Work Plan	*Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California*
YBI	Yerba Buena Island

1.0 Introduction

This Task-Specific Plan (TSP) presents the specific tasks and procedures that will be implemented by CB&I Federal Services LLC (CB&I) during a radiological scoping survey at the Installation Restoration (IR) Site 12 housing units at former Naval Station Treasure Island (NSTI) (Figures 1 and 2). CB&I will conduct radiological surveys of the interior ground floors of IR Site 12 housing units to assess the exposure health risk to current residents and address data gaps for the IR Site 12 remedial investigation. In addition, building configurations with upper units (1400 series building units only) will require garage surveys. Ultimately, the data collected will support the "Finding of Suitability for Lease" process relating to the leasing program.

This work is being performed for the U.S. Department of the Navy (Navy), Naval Facilities Engineering Command Southwest, under Contract No. N62473-10-D-2005, Contract Task Order (CTO) 0005. In 2012, the Navy issued CTO 0010 to Contract No. N62473-10-D-0807 to perform a non-time critical removal action at the Bigelow Court solid waste disposal area at IR Site 12. The *Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California* (Work Plan; CB&I, 2014a), CTO 0010, includes the same and/or very similar work elements and constitutes the basis for this TSP and the work to be performed. This TSP includes clarifications and captures new procedures and work to be performed under CTO 0005 that may be different from the CTO 0010 Work Plan.

Work performed under this TSP will also follow the provisions of the project *Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (APP/SSHP; CB&I, 2013) and the *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California* (Sitewide RPP; CB&I, 2014b, as updated or revised). This work will be performed in accordance with the California Radioactive Materials License 7889-07, issued to CB&I. Base Realignment and Closure Program Management Office West will manage the work elements under this CTO. A project schedule is included in Figure 3.

1.1 Site Description

Treasure Island (TI) is a 403-acre manmade island located next to a natural rock island, Yerba Buena Island (YBI), in the San Francisco Bay (Figure 1). TI was constructed of materials dredged from the San Francisco Bay from 1936 to 1937 for the Golden Gate International Exposition of 1939 and 1940. In 1940, the Navy began leasing TI from the City and County of San Francisco and later, during World War II, gained full ownership of NSTI. YBI, a 147-acre natural island, has been under military control since 1867. The primary function of YBI was to

provide training, administration, housing, and support services to the U.S. Pacific Fleet. In 1993, NSTI was designated for closure under the Base Realignment and Closure Act of 1990. NSTI was operationally closed on September 30, 1997.

In 1999, at the request of the City of San Francisco, by and through the Treasure Island Development Authority (TIDA), the approved Local Redevelopment Authority, the Navy leased the former military housing on NSTI to the City of San Francisco. The housing area is located on the northwestern portion of TI.

The housing area was originally used as a parking lot during the Golden Gate International Exposition of 1939 and 1940. After Navy occupation of TI in 1940, the area was developed for bunker storage of munitions and other materials, vehicle and equipment storage, recreational playing fields, and disposal and burning of waste. Beginning in the 1960s, the areas were incrementally developed into housing for Navy personnel and their dependents. The former military housing consists of multiplex housing units with private backyards and common area front yards, side yards, and surrounding greenbelts.

Today, the former military housing is used for market-rate housing and supportive-services. Table 1 lists the housing providers currently managing the leases for the units. The housing area is approximately 105 acres. There are 872 housing units (4 to 8 units per building) of which 726 units are available for use by TIDA under lease (Figure 2); 144 units remain offline today due to the Navy's efforts to conduct environmental cleanup actions. Figures 4 through 10 show the buildings unit groupings and building unit details as they are designated A-F as applicable. Table 2 lists the addresses of the leased units as well as the units that are offline and consequently unoccupied.

1.2 Scope of Work and Objective

The scope of work for this project includes supporting and attending various meeting, the preparation of this TSP, conducting radiological exposure rate surveys in all leased housing units (and garages where applicable) at IR Site 12 housing area per the agreed upon schedule, and prepare a human health risk assessment using the survey data collected. Completing the occupied housing surveys has priority over the unoccupied housing surveys.

The objective of this project is to collect and present high quality data from the housing units that is satisfactorily comprehensive to support defensible, real-time decisions to protect human health. The surveys shall be satisfactorily comprehensive to support no further investigation of the housing units if no radiological impacts are found, or alternatively, support a recommendation that a lease be modified or terminated if radiological exposure exceeds a pre-determined risk threshold.

1.3 Guiding Documents

The Work Plan (CB&I, 2014a) developed under Contract No. N62473-10-D-0807, CTO 0010 includes the same and/or very similar work elements and constitutes the basis for this TSP and the work to be performed. Work activities will be accomplished in accordance with California Radioactive Material License 7889-07 and the procedures and methodologies detailed in the documents discussed in the following subsections.

1.3.1 Work Plan

The Work Plan (CB&I, 2014a) provides the projectwide processes and procedures. The supporting documents appended to the Work Plan include a radiological survey and demolition plan, an environmental protection plan, and a contractor quality control plan for the project.

1.3.2 Data Management Plan

The Data Management Plan (Appendix A) references and discusses how survey data will be named, stored, and managed, including the type of database to be used, software programs, survey tracking, and how the data will be recorded and displayed.

The Data Management Plan (Appendix A) elaborates on the proposed method to efficiently manage data and information collected from performing the surveys.

1.3.3 Contractor Quality Control Plan

The Contractor Quality Control Plan (Appendix B) reference has been updated with the definable features of work applicable to this project and other items specific to the work to be performed during the surveying of the housing units including building unit surveys, and reporting.

1.3.4 Accident Prevention Plan

The APP/SSHP (CB&I, 2013) was prepared to support fieldwork in accordance with the *Safety and Health Requirements Manual, EM 385-1-1* (U.S. Army Corps of Engineers, 2008) and *Unified Facilities Guide Specifications*, Section 01 35 26, "Governmental Safety Requirements" (Naval Facilities Engineering Command, 2012). The APP/SSHP was submitted under a separate cover. An addendum to the APP/SSHP was issued as part of the CTO 0005 building scoping survey work to capture the additional scope including moving of furniture. A separate activity hazard analysis was also developed for these activities. The addendum to the APP/SSHP and is available under a separate cover.

1.3.5 Radiation Protection Plan

The Sitewide RPP (CB&I, 2014b, as updated or revised) was prepared to support work performed by CB&I at all radiologically-impacted (confirmed or potential) sites at NSTI. It is a

standalone document tied to California Radioactive Materials License 7889-07 issued to CB&I, and is available under a separate cover. The Sitewide RPP documents contractor requirements and standard operating procedures to ensure qualified personnel, proper radiological controls, and approved standard operating procedures are used to perform radiological surveys and work at NSTI.

2.0 Site Conditions

The following subsections describe the site conditions as it relates to each type of building configuration included in the radiological scoping surveys.

2.1 1100 Series Buildings

The 1100 series housing community is located on the northwest end of NSTI and consists of 240 units built in 1966 (Figure 2). The units consist of three- and four-bedroom, two-story apartments with four to eight units per multiplex. The buildings are wood frame constructions on concrete slab foundations with a mix of composition shingle and built-up roofs. Original exterior stucco walls have been covered with vinyl siding, except for storage sheds and second floor overhangs. Each individual unit has a forced air furnace and water heater located in a mechanical (utility room) accessible from the outside of the unit. Figures 11 through 16 show the unit configurations available for the 1100 series units.

Photograph 1
Typical 1100 Building Series Multiplex

Photograph 2
Typical 1100 Building Series Unit

2.2 1200 Series Buildings

The 1200 series housing community is located on the northwest end of NSTI and was built in 1969. There are 340 units with two-, three-, and four-bedroom, two-story apartments with four to eight units per multiplex. The buildings are wood frame constructions on concrete slab foundations with a mix of composition shingle and built-up roofs. The original exterior stucco walls have been covered with vinyl siding, except for storage sheds and second floor overhangs. Each multiplex has a centralized hydronic heating unit and water heater located in a mechanical room on one end of the building that serves all the unit that are part of the multiplex. Figures 14 through 16 show the unit configurations available for the 1200 series units.

Photograph 3
Typical 1200 Building Series Multiplex

Photograph 4
Typical Two-Story 1200 Building Series Unit

2.3 1300 Series Buildings

The 1300 series housing community consists of 124 units built in 1970. These multiplexes are located on the northwestern end of NSTI. The multiplexes consist of four-bedroom, two-story apartments with four to six units per multiplex. Buildings are wood frame constructions on concrete slab foundations with composition shingle roofs. The original exterior wood siding has been covered with vinyl siding, except for second floor overhangs. Each individual unit has a

forced air furnace and water heater located in a mechanical room located inside the unit. Figure 19 shows the unit configurations available for the 1300 series units.

Photograph 5
Typical 1300 Building Series Multiplex

Photograph 6
Typical Two-Story 1300 Building Series Unit

2.4 1400 Series Buildings

The 1400 series housing community is the most recently constructed on NSTI and consists of 200 units built in 1989. The multiplexes are located on the northwest end of the island. Units are two-bedroom apartments with four to six units per multiplex. Buildings are wood frame

constructions on concrete slab foundations with composition shingle roofs. Exterior walls are stucco with brick trim on some of the multiplexes. Each individual unit has a forced air furnace and water heater located in a mechanical room inside the unit. Figures 18 and 20 outline the unit configurations. The vast majority of the 1400 series buildings include six one-car garages in each multiplex. Two of the 1400 series buildings (Buildings 1442 and 1447) are of a different design and have only four garages.

Photograph 7
Typical 1400 Building Series Multiplex

Photograph 8
Typical 1400 Building Series Unit

3.0 Regulatory Framework

The U.S. Department of Defense developed the IR Program in 1981 to comply with Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) and other federal and state environmental regulatory requirements. The IR Program is specific to military facilities and its purpose is twofold: (1) to identify, investigate, and clean up or control releases of hazardous substances, and (2) to reduce the risk to human health and the environment in a cost effective manner. The applicable environmental requirements are in programs that include the following:

- CERCLA Program
- Petroleum Program
- Polychlorinated Biphenyl Program
- Residential Lead-Based Paint program
- Asbestos-Containing Material Program
- Radiological Program

Under the CERCLA Program, environmental investigations and cleanup began on NSTI in the mid-1980s and continues today. The initial facilitywide preliminary assessment/site inspection was conducted in 1987 to identify areas on TI and YBI that required further investigation. The Navy identified 33 IR sites (24 CERCLA sites and 9 petroleum sites) on TI and YBI.

As the lead federal agency, the Navy, including the Radiological Affairs Support Office (RASO), is working with the state lead agency California Department of Toxic Substance Control (DTSC), California Department of Public Health, and California Regional Water Quality Control Board to develop and implement this CTO. The Navy coordinates activities at NSTI with the regulatory agencies under the terms of the 1992 Federal Facility Site Remediation Agreement. Navy, DTSC, and California Regional Water Quality Control Board representatives are collectively referred to as the Base Realignment and Closure Cleanup Team (BCT) for NSTI. California Department of Public Health works with DTSC to provide technical support on the radiological program. Other agencies and organizations also provide support to the BCT and the environmental program, including the TIDA, the Treasure Island Community Development, the Restoration Advisory Board, the Restoration Advisory Board technical focus group, and other public groups.

3.1 Regulatory Process

The Navy is directing this action under the U.S. Department of Defense IR Program in accordance with requirements of the CERCLA and the National Oil and Hazardous Substances Pollution Contingency Plan (Code of Federal Regulations, Title 40, Part 300). The work will be conducted in accordance with Section 121(e) of CERCLA (42 United States Code, Section 9621[e]), as amended, which states that no federal, state, or local permits shall be required for the portion of any removal or remedial action conducted entirely on site. All substantive requirements will be met.

4.0 Project Requirements

This section identifies the project screening criteria to be applied during the building unit scoping surveys.

4.1 Project Screening Level

The radionuclide of concern for the entire project area is radium-226. The project screening level for NSTI is listed in Table 3. The instruments deployed are listed in Table 4.

4.1.1 Data Quality Objectives

The data quality objectives for the radiological scoping survey of the building units are provided in Table 5.

5.0 Survey Design

This section addresses the overall scoping survey design and basis.

5.1 Survey Objectives

The Navy's objectives for the performance of the IR Site 12 housing unit scoping surveys are as follows:

- Conduct radiological (gamma) surveys of the ground floor interiors of all housing units to assess the exposure health risk to current residents
- Address data gaps for the IR Site 12 remedial investigation
- Support the "Finding of Suitability for Lease" process relating to the leasing program

The scoping survey design described in the following sections was developed to support these objectives.

5.2 Survey Layout

A total of 18 potential housing layouts are anticipated in the housing units. The housing units have upstairs bedrooms with the exception of the 1400 series housing units. The housing units are as follows (each type has a reverse image, reflected in the "a" and "b" designations):

- 1a and 1b—1100 Series three-bedroom, corner kitchen
- 2a and 2b—1100 Series three-bedroom, center kitchen
- 3a and 3b—1100 Series four-bedroom
- 4a and 4b—1200 Series two-bedroom
- 5a and 5b—1200 Series three-bedroom
- 6a and 6b—1200 Series four-bedroom
- 7a and 7b—1300 Series
- 8a and 8b—1400 Series, three-car garage units and downstairs bedrooms
- 9a and 9b—Buildings 1442 and 1447 (two car-garage units)

The first floor layout of each housing unit has been overlaid with a standardized 1-square-meter grid to facilitate survey performance, mapping, and comparison between housing units. Each

survey grid cell will be subject to scanning and a stationary measurement unless obstructions prevent survey access.

5.3 Instrumentation

The primary instrument that will be used to determine compliance with the project screening levels (Table 4) is the Ludlum Model 193-6, described in Section 5.3.1. Survey data will be recorded on mobile devices as detailed in Section 5.3.2 and the Data Management Plan (Appendix A). If needed, additional investigation may be performed using the instruments discussed in Section 5.3.3.

5.3.1 Primary Radiation Detector

Housing unit scans will be performed using the Ludlum Model 193-6 survey meter (193-6). The instrument has a 15.2-centimeter (6-inch) diameter by 2.5-centimeter (1-inch) thick plastic scintillator (Ludlum Model 44-132) mounted at the end of an extended reach pole. The user operates a four-scale analog ratemeter attached to the opposite end of the pole (Figure 22).

The detector measures gamma radiation over a wide range of energies. As shown in the energy response curve (Figure 23) (Ludlum Measurements, Inc. 2014), the relative efficiency of the 193-6 for a gamma energy of 609 kilo electron volts (the primary gamma emission from bismuth-214, a decay product of radium-226) is similar to the relative efficiency of the instrument for gamma emissions at 661 kilo electron volts (the primary gamma emission of cesium-137). Therefore, the instruments are calibrated by the manufacturer with a National Institute of Standards and Technology-traceable cesium-137 source.

The ratemeter has the following four scale-settings, which are selected by a rotary switch on the front panel of the unit (Figure 22):

- x1: range of 0 to 1 microroentgen per hour (µR/hr)
- x10: range of 0 to 10 µR/hr
- x100: range of 0 to 100 µR/hr
- x1000: range of 0 to 1,000 µR/hr

Measurements will be recorded to the nearest tick-mark on the meter face, and no interpolation between tick marks will be performed. For example, on the "x10" scale, measurements will be observed and recorded in increments of 0.4 µR/hr (e.g., 3.2, 3.6, 4.0, 4.4, etc.). On the "x100" scale, measurements will be observed and recorded in increments of 4 µR/hr (e.g., 4, 8, 12, 16, 20, and 24).

The instrument will be used with the audio response transmitted through a headset to the technician. The "fast" response will be used during the scan of each survey grid cell. For the final measurement within each cell, the "slow" response setting will be used; after resetting the meter using the "reset" button, the needle will be allowed to equilibrate for 20 to 30 seconds. The survey team will record the measurement to the nearest tick-mark.

A minimum detectable exposure rate for the 193-6 is calculated as follows based on the audio response of the two-sigma internal alarm function. From the instrument calibration certificate, 193-6 # 293633 has an observed count rate of 1.19E+06 counts per minute (cpm) at an exposure rate of 800 µR/hr. This ratio results in a cpm to µR/hr ratio of 1,487.5 cpm per µR/hr, which is similar to the published value of 1,500 cpm per µR/hr (Ludlum Measurements, Inc., 2013).

The average background exposure rate of 4 µR/hr expressed in terms of count rate in counts per second is as follows:

$$4\ \frac{\mu R}{hr} \times 1{,}487.5\ \frac{cpm}{\mu R/hr} = 5{,}950\ cpm \times \frac{1\ cps}{60\ cpm} = 99.2\ cps$$

Assuming a normal distribution of the eight 1-second counts that are averaged to determine the instrument background, the one-sigma (σ) and two-sigma (2σ) values are calculated as follows:

$$\sigma = \sqrt{99.2} = 9.96\ cps$$

$$2\sigma = 2 \times \sqrt{99.2} = 19.9\ cps$$

The two-sigma (2σ)value in cpm is equal to:

$$19.9\ cps \times \frac{60\ cpm}{1\ cps} = 1{,}194\ cpm$$

With a 12-inch per second scanning speed and a 6-inch detector width, the observation interval is assumed to be equal to 0.5 seconds. Therefore, the minimum detectable exposure rate based on a 0.5 second observation interval is as follows:

$$\frac{19.9\ cps}{0.5\ s} \times \frac{60\ cpm}{1\ cps} \times \frac{1\ \mu R/hr}{1487.5\ cpm} = 1.6\ \mu R/hr$$

Therefore, in a background radiation field of 4 µR/hr and with an observation interval of 0.5 second, the minimum detectable net exposure rate is 1.6 µR/hr.

5.3.1.1 193-6 Instrument Startup Procedure

The 193-6 collects an ambient background measurement during the first eight seconds of operation following either starting the instrument, or depressing the "reset" button. The

background collected by the instrument during this interval is then used for an internally calculated alarm setpoint equal to two-sigma above background.

The standard background collection point within each residential unit will be one meter into the interior of the residence, at the center point of the front doorway, at a height of 4 inches. Upon entry into each residence, the technician will close the front door and position the detector at the entryway background point and will depress the reset button to establish the instrument background for the residence. The detector will remain stationary until the background collection has completed. The technician will then hold the detector stationary in the "slow" response mode to collect a numerical background value to input into the survey data collection device.

The background measurement will be compared by the survey team to what is expected based on other residential surveys and observed ranges. If the standard background collection point exceeds what is expected (for example, is greater than 6 µR/hr), an alternate background collection point within the residence may be established and documented.

5.3.1.2 193-6 Reset Procedure

During the course of scanning surveys, it may be necessary to re-establish the two-sigma alarm set point to allow for delineation of identified anomalies. If a large elevated area is detected, the technician may navigate to the our edge of the anomaly and use the reset button to re-establish a higher background and two-sigma alarm point, which then may be used to identify higher readings toward the center of the anomaly. This process may continue until the location of the highest levels is reached.

After concluding the investigation at a particular area and prior to surveying the next cell, the technician will return the 193-6 to the background collection point and re-collect the instrument background, as described in Section 5.3.1.1.

5.3.1.3 193-6 Quality Control

The quality control process for the 193-6 instruments will follow the process for all CB&I radiation detection instrumentation described in *Treasure Island Work Instruction* TIWI-12-01 (Shaw Environmental, Inc., 2012). Prior to use, instrument control values at background and with a cesium-137 source will be established by the collection of a baseline measurement. At the beginning and end of each day of instrument use, the background and source responses will be collected in the same geometry and location (Building 570) as the initial baseline measurement. Any measurements that are outside the acceptable range of the baseline plus or minus 20 percent will result in the instrument removed from service that day.

5.3.2 Building Survey and Instrument Data Collection

Scans will be performed within each accessible cell with the 193-6 at a height of 4 inches above the floor surface, at a scanning speed of 12 inches per second. During the scan, the radiological control technician (RCT) will use the audio response (via a headset) to identify exposure rate levels above the instrument two-sigma alarm set point, while visually monitoring the needle to mentally track observed exposure rates. If any audio alarm indications and upward meter needle detections are noticed, the RCT will pause for approximately 10 seconds to determine that the measurement is constant, suggesting the presence of a radioactive source. The RCT will use the ratemeter display to determine if the project screening levels are exceeded. If scan measurements within the cell do not identify any locations exceeding the project screening levels, a stationary exposure rate measurement will be collected from the center of each cell at 12 inches.

5.3.3 Recording of Field Data

Data from the scoping surveys performed with the Ludlum Model 193-6 will be recorded in the field on a mobile data collection device (e.g., tablet). The tablet will have a visual display of survey progress within each housing unit to allow the survey team to identify locations requiring survey. When measurements above the screening levels are entered, the tablet will prompt the technician team for additional measurements and other information, such as photographs. Similarly, the tablet will prompt the survey team for additional information when data cannot be collected from a particular survey cell. Upon entry, a date and time stamp will be applied to the measurement record.

Once the survey in a housing unit is complete, data from the tablet will be uploaded to a server for further evaluation and reporting. Additional details about the data management system are provided in the Data Management Plan (Appendix A).

5.3.4 Secondary Radiation Survey Detection

In the event that the project screening level of 2 µR/hr above background at a 4-inch height is exceeded, additional investigation will be conducted to obtain further information on the area to confirm the measurements and identify appropriate next steps. The follow-up measurements will include the following:

- Floor contact measurement using 193-6.
- 4 and 12 inches above ground surface measurements using 193-6.
- 3 feet above ground surface (waist level) measurement using 193-6.
- Collection of systematic measurements using the 193-6 and Ludlum Model 44-20 3-inch by 3-inch sodium iodide detector and Ludlum Model 2221 ratemeter/scaler (cpm) at 6-inch and 12-inch intervals from the apparent center of the anomaly. Measurements will be collected at a 4-inch height at nine locations (one measurement

at the center of the "bullseye" and two measurements along each directional axis). For the purposes of this survey, "north" will correspond to the upward orientation of the survey map.

- Radionuclide identification using Canberra Inspector 1000 multi-channel analyzer (or equivalent), such as identification of lead and bismuth energy peaks associated with radium-containing materials. Data will be collected with the detector on contact with the highest measurement location for a minimum 10-minute collection time.
- Additional measurements following communication with Navy RASO. Additional demographic data may be collected following identification of non-traditional room use such as dining room used as bed room or infant/child occupancy.

Details regarding the project instruments are provided in Table 4. Additional measurements will be documented in the tablet, as described in Section 5.3.2.

5.4 Follow-Up Actions

Based onto the project screening level results, CB&I will perform additional follow-up surveys as determined appropriate by the Navy on case-by-case basis.

5.5 Reference Background Areas

Background levels of the gamma emissions detected by the 193-6 and other instruments used during the scoping surveys may be influenced by naturally-occurring radioactivity present in the fill material under the housing units; the concrete foundations of the housing units; and other building materials used, such as wood and tile. There are no housing units outside of IR Site 12 at NSTI; therefore, no directly-comparable (in terms of construction) reference areas are available. Prior to performance of the scoping surveys, a baseline study will be performed to identify potential ranges of background at various non-impacted locations at NSTI, including Buildings 1125 and 1233, Building 570, Building 1, and others as appropriate to obtain baseline measurements. Where possible, locations will be researched to determine construction dates that may match those of the housing units to identify similar concrete characteristics. Based on prior experience performing work at NSTI, a significant variability in background response for the 193-6 units is not anticipated. Background is expected to be between 3 and 5 µR/hr for the instruments. Once the standard range is determined, an instrument with background that falls outside that range will be removed from service and/or recalibrated to ensure consistent performance and repeatability from all instruments. As noted in Section 5.3.1.1, the 193-6 records an eight-second background measurement following instrument startup or reset. The standard background collection point within each residential unit will be one meter into the interior of the residence, at the center point of the front doorway, at a height of 4 inches.

6.0 Pre-fieldwork Activities

This section describes the activities to be initiated prior to building scoping survey work is begun.

6.1 Meetings

Project team meetings will be held routinely leading up to and throughout the project in accordance with the CTO 0005 contract.

6.1.1 Project Team Meetings

Anticipated project team meetings prior to fieldwork include:

- Project kick-off meeting
- Internal meeting on TSP
- External meeting on TSP
- Meeting on resolving response to comments
- Survey kick-off meeting

Other meetings to establish and review the work schedule, quality control, and health and safety performance will also take place as necessary. Regulatory meetings that will be intended include monthly BCT meetings and BCT technical meetings as necessary. CB&I will also provide support to the Navy for management briefing meetings.

6.1.2 CB&I Federal Services LLC/U.S. Department of the Navy Orientation Session

Prior to starting fieldwork, CB&I will coordinate a one day radiological orientation meeting focused on the survey approach and instrument capabilities for the Navy's "ombudsmen/liaisons" at TI. In addition to the CB&I trainers and project management, the CB&I field team supervisors will also attend. The goal of this session will be to convey how the radiological instruments work and unify the terminology to be used during the surveys.

6.1.3 Pre-construction Meetings

A pre-construction meeting will be held prior to mobilization of facilities (if required) and personnel. The purpose of the meeting will be to discuss project-specific topics, roles, and responsibilities of all project personnel, project schedule, health and safety concerns, and other topics that require discussions before field mobilization. The pre-construction meeting will be attended by representatives of the following:

- Navy (Navy Remedial Project Manager, Resident Officer in Charge of Construction [ROICC], Caretakers Site Office, and RASO as applicable)
- CB&I (including Project Manager, Radiation Safety Officer, Team Supervisors, Site Quality Control Manager, and Site Safety and Health Officer)
- Subcontractors as appropriate

6.1.4 Construction Quality Control Meetings

A construction quality control meeting will be held on a weekly basis throughout the course of fieldwork. At a minimum the Navy ROICC and the CB&I Project Quality Control Officer will attend this meeting. As appropriate, other site personnel, subcontractor, and vendor representatives will attend as necessary. The agenda for the meetings will encompass the project status review, work accomplished, scheduling issues, identification of action items, and corrective measures and will be provided in advance of meetings.

6.1.5 Health and Safety Meetings

Daily health and safety meetings (tailgate meetings) will be held before starting work. All fieldwork staff as well as subcontractors (as applicable) will attend these meetings and sign a tailgate summary and attendance form. The meetings will be hosted by the Site Safety and Health Officer and will cover various safety issues. Navy liaisons, subcontractors, agencies, and/or other Navy personnel that visit the site during the course of the day will be required to review and sign the tailgate summary form prior to proceeding to the site.

6.2 Permitting and Notification

There is no anticipated need for permits in preparation for this building scoping survey.

A single sheet (two-page) work notice will be distributed to each housing unit as applicable a minimum of 48 hours prior to building scoping surveys start. CB&I will prepare the work notice, which will included information about the work to be performed, when work will start, how long it will take, and contact information. The work notice will be reviewed by the Navy, DTSC, and TIDA prior to distribution. CB&I will work with the Navy ROICC, Caretakers Site Office, and TIDA to arrange for the distribution of the work notice flyers to residents. The work notice will be distributed to the residents by the housing providers at NSTI.

6.3 Mobilization

Mobilization for the building scoping surveys will include procurement of materials and instruments, establishment and travel of field and technical staff, as well as the equipment and infrastructure needed to support and execute the activities described in this TSP. During mobilization, the site will be prepared for field activities including installation of phone and data systems, possible site trailers, electricity hook-ups, and copiers.

Equipment, instruments, and materials will be delivered and inspected. Items will be appropriately stored and secured during mobilization.

If site trailers are mobilized and required tie-downs, a utility clearance will be conducted prior. Utility location clearance will be based on third-party geophysical utility location, the review of Navy utility drawings by CB&I personnel and field observations. The marked area will be larger than the trailer footprint to ensure adequate coverage of utility clearance. Utility line locations identified during review of Navy utility drawings will be marked by CB&I using color-coded surveyor paint and American Public Works Association-approved colors. Field observations of surface expressions (cleanouts, risers, manholes) will be used as guides during the utility marking work. Additionally, local utility providers will be notified through USA North (at a minimum of 48 hours prior to beginning fieldwork) to field locate their buried utilities within the proposed excavation boundaries.

6.4 Reconnaissance Survey

A reconnaissance survey of available (empty) housing units will be conducted prior to start of actual fieldwork. This survey will facilitate a good understanding of housing unit layouts and allow for the field team to develop an efficient way to overlay the radiological survey grid. The reconnaissance survey will also allow for the team to establish building material background measurements.

7.0 Site Work

This section details the field team members and activities that will be performed during the scoping survey at each housing unit.

7.1 Field Teams

During full field operations, up to six CB&I field teams will be conducting surveys within the housing units. The CB&I field teams will each consist of five personnel. The specific roles and responsibilities of each team member are as follows:

- Team supervisor: Primary interface with Navy/TIDA liaisons; primary contact with project management team (project manager, project radiation safety officer, Site Safety and Health Officer, etc.)
- Senior RCT: Primary user of 193-6 for survey. Will have experience and qualifications in accordance with or equivalent to American National Standards Institute/American Nuclear Society Standard N3.1-1993, *American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plants.*
- Junior RCT: Primary user of data collection tablet. May operate 193-6 under Senior RCT supervision. Qualified as a Junior RCT under CB&I procedures.
- Laborers (two): Will assist in movement of furniture to facilitate the scoping surveys.

Prior to starting the surveys, each field team will attend project-specific training which details the requirements for the housing unit surveys, including safety, survey performance, data collection, attire and conduct, and communications. All field team members will be expected to conduct themselves in a professional manner at all times.

In addition to CB&I personnel, there will be housing provider liaisons and Navy ombudsmen involved and overseeing fieldwork. The housing provider will be the initial representative communicating with residents.

7.2 Survey of Empty Units

The Navy has identified 53 housing units that are currently unoccupied. It is the goal that these housing units are amongst the first to be surveyed by the field teams to allow for familiarization with the survey approach. The surveys in the empty units provide an opportunity to address unforeseen data collection issues without inconveniencing residents.

In the empty units, a survey grid will be taped out on the floor in painter's tape (or similar nonpermanent tape). This will allow the field teams to understand the locations of each cell within the occupied housing units, which may have furniture or other obstructions.

The survey within the empty units will be conducted as detailed in Section 7.3 with the exception of furniture movement.

7.3 Survey of Occupied Units

This section discusses the logistics and execution of the building surveys.

7.3.1 Coordination

Figure 4 identifies the general order that the housing units will be surveyed. At the end of each workday, CB&I will work with the Navy and TIDA to identify the scheduled housing units for the next day. Based on an average production rate of two completed housing unit surveys per day, four housing units will be scheduled for each field team. The four housing units per team will allow for a consistent production rate by providing for delays in access, faster than expected surveys, etc.

More than one field team will work within the same building or general area when possible. Temporary vehicle parking and toilet facilities for workers will be mobilized to central areas accessible by multiple field teams. Temporary furniture storage (e.g., moving vans, flat beds) will be parked outside the buildings where field teams are working.

For the garages in the 1400 Series housing units, advance notice will be given to both first floor and second floor residents who might be using the garages. In addition, cars will be requested to be moved from the driveways to facilitate access to garages in the work notices(s). CB&I will work with the Navy ombudsmen/liaisons to have cars moved as needed. CB&I will not tow vehicles that are obstructing work progress.

7.3.2 Initial Entry and Preparation

Upon entry into the housing unit, the team supervisor and Navy/TIDA liaison will do an initial visual survey of the first floor to identify any obvious safety hazards or survey obstructions. The team supervisor will then brief the field team on any identified issues, and will coordinate required furniture movement. Prior to moving furniture, the team supervisor will ensure that the general use of each room is documented and that a detailed record of the location of key pieces of furniture is generated. Key pieces of furniture include couches, futons, baby cribs, etc. The CB&I team supervisor will document any furniture moved outside the housing unit so that it may be moved back to the correct location. Laborers will use hand-trucks, furniture slider pads, moving blankets, etc. to safely move or relocate furniture within or outside the housing units.

During this time, the RCTs will identify the layout of the housing unit (Section 5.2) and will select the correct survey template on the tablet. Additional initial information, including housing unit identification, RCT identification, and 193-6 serial number, will be entered into the tablet.

As necessary, field teams may place painters tape on floors or walls to use as guides to identify survey grid cell locations. Placement of a complete survey grid on occupied housing unit floors is not required. A 1-square-meter plastic survey template, or equivalent, will be placed on the floor to allow the technician to visualize scan speed and progress within each individual cell.

7.3.3 Radiological Scans in Housing Unit

The RCTs will progress through the housing unit to perform scanning measurements within each accessible grid cell. Field team laborers will move furniture and personal belongings as required. The RCTs may elect to survey open (i.e., no furniture) cells first while the field team laborers move or reposition furniture. During the scan, the RCT will primarily use the audio response (via a headset) to identify discernible increases in exposure rate levels. The RCT will pause at locations with more frequent beeps to determine the measurement is constant, suggesting the presence of a radioactive source. As described in Section 5.3.2, the RCT will use the ratemeter display to determine if the project screening levels are exceeded. If scan measurements within the cell do not identify any locations exceeding the project screening levels, a stationary exposure rate measurement will be collected from the center of each cell.

The stationary measurement will be recorded in the tablet by a trained team member. The measurement will be compared with the project screening levels and if any are exceeded the user will be prompted for additional action before moving to the next measurement location. The team supervisor will check the data for quality control and transcription errors upon completion of surveys and make the determination that data has been collected as required in each unit.

In general, each unit survey effort will be completed during the same day it was started, unless the unit surveyed is empty.

7.3.4 Anomalous Measurements

There are two types of anomalous measurements anticipated for the housing unit scoping surveys. A measurement entry may be considered anomalous if there is no measurement for the location due to obstructions. The tablet will recognize the issue and will require the user to provide additional information (i.e., photograph and description) about the obstruction. This information will be used to identify potential data gaps at the conclusion of the study.

The second type of anomalous measurement is an exposure rate measurement that exceeds the project screening level. As noted in Section 7.3.3, a tablet entry exceeding one or more of the project screening levels will prompt additional action by the field team. Additional activities will

include measurements with the Ludlum Model 44-20 and Inspector 1000, photographs of the location, and a description of any additional details. The field teams will contact the project radiation safety officer or radiological controls supervisor in the event of a measurement elevated above one of the project screening levels. The radiation safety officer or radiological controls supervisor will, in turn, notify project management.

Independently of potential obstructions such as furniture, the survey team will make every attempt to collect representative data from each unit to support a human health risk evaluation.

7.3.5 Survey Completion

The survey within a housing unit will be considered complete when all survey cells have been scanned or otherwise documented; elevated measurements have been investigated; and relocated furniture has been moved back to its original position. The team supervisor will review the completeness and results of the survey with the Navy/TIDA liaison. In order to finalize the survey record in the tablet, the team supervisor will need to electronically sign the form. Should the survey need to be reopened, a signature is required from the team supervisor and the reason for the revision will be documented.

8.0 Communication Plan

This communication plan describes the approach for communicating field information and survey data. The plan identifies the audiences for the project, the information to communicate and the communication methods to use.

8.1 Project Audiences

Because of the urgency to establish that the residents living at the NSTI remain safe, the communication plan includes communication to the following main audiences:

- CB&I project team
- Navy ombudsmen/liaisons
- Navy RASO
- Navy Base Realignment and Closure Management
- Navy ROICC
- Navy Caretakers Site Office
- Regulatory agencies
- TIDA
- NSTI housing unit residents
- The public

8.2 Project Team Organization

The project team will consist of managers, administrators, and professionals necessary to coordinate and implement the removal activities under this CTO. A project organization with a defined "chain of command" has been established for operations. A project organization chart with contact numbers and project responsibilities is provided (Appendix B, Figure 1).

8.3 Project Information

The following categories of information relevant to the project audiences will be generated:

- Building unit survey data
- Static readings

- Survey data exceeding project screening level including specific information about the location (photograph, description, etc.)
- Schedule/sequence of work/plan of the day
- Inaccessibility—if survey team cannot gain entry to a building unit and why (lose pets, sick child, etc.)
- Daily Reports

If no significant survey meter readings or events have taken place, the data and results collected during work will be provided to the Navy Remedial Project Manager and RASO Environmental Project Manager by 10:00 a.m. pacific daylight time (PDT) the following workday. The reports will include the following information:

- Description of work completed
- Deviations from project plans or TSP and the reason for these changes, if any
- Damaged furniture and/or personal property, if any
- Any loss reported by resident, if any
- The work that is planned to be accomplished during the week of the report
- Any complications that are identified in the field, how the contractor will resolve the complications and if they will affect the schedule
- A general summary of the data that was collected the previous day and a brief discussion of areas of elevated activity, if applicable

8.4 Project Communications and Notifications Requirements

Table 6 provides the project members and contact information. Table 7 summarizes the events for which notifications will be made and the persons and/or agencies to which the notifications will be made.

The onsite TIDA liaisons will make the first contact with each resident to inform of the building survey process and communicate results upon completion of the surveys as appropriate.

The Navy onsite ombudsmen/liaisons will be informed of an elevated project screening level encountered in a building unit as soon as practical by the CB&I project team. In addition, Navy RASO will be contacted via phone if not on site. Follow-up information will be provided in writing no later than with the daily report by 10:00 a.m. PDT (at a minimum) the following workday.

The overall approach is that all furniture in a building unit is to be moved as needed to accommodate radiological data collection. If personal property is deemed particularly cumbersome or unsafe to move by the survey team, the Navy ombudsman/liaison will be contacted by the survey team supervisor to obtain acceptance. Only in very unique situations will it be acceptable to the Navy to not move a piece of furniture to facilitate radiological surveys. Such circumstances will be documented in detail on the building unit survey report (tablet).

CB&I will not communicate results or concerns to anyone but the Navy. Only the Navy communicates with TIDA, the regulatory agencies, the NSTI housing unit residents, and the public. CB&I will refer all public inquiries to the Navy's Public Affairs Officer.

8.5 Other Navy Contractors

Other Navy contractors will be informed of the building survey fieldwork via updating the Memorandum of Understanding (MoU) between contractors. CB&I will initiate a revision of the pre-existing MoU and obtain Navy RASO concurrence of the content prior to signing. Only Navy contractors currently working at NSTI under their respective radiological license is a signatory of the MoU.

9.0 Data Evaluation

The survey data collected according to project data quality objectives will be both quantitative and qualitative in nature. Exposure rate data will be analyzed quantitatively for direct comparison to the project screening levels and reviewed qualitatively to determine whether further investigation is appropriate. Locational data, photographs, and visual observations will be used as qualitative inputs.

9.1 Data Analysis

The data analysis for the scoping surveys described in Section 7.0 will include the following activities:

- Compilation of summary statistics for individual housing units
- Review of data for trends and outliers
- Review of data collection for completeness and conformance with project requirements

Survey data will be analyzed to identify distribution trends and potential outliers. Data analysis may include inspection of measurement results using posting plots, cumulative frequency distributions, histograms, etc., as required, and calculation of statistical quantities including mean, median, standard deviation, and range. Data analysis of survey results will be performed in the field, as necessary, to evaluate whether an investigation or collection of additional survey data is warranted. Data analysis will include investigation of spatial or temporal distribution, outliers, and data population distributions.

9.2 Data Validation and Verification

Survey data will be reviewed to verify that they are authentic, appropriately documented, and technically defensible. The review criteria for data acceptability are as follows:

- The instruments used to collect the data were capable of detecting the radiation types and energies of interest at or below the radiological screening level.
- The calibration of the instruments used to collect the data was current, and the radioactive sources used for calibration were traceable to the National Institute of Standards and Technology.
- Instrument response was checked before and, where required, after instrument use each day data were collected.

- The minimum detectable concentrations and the assumptions used to develop them were appropriate for the instruments and the survey methods used to collect the data.
- The survey methods used to collect the data were appropriate for the media and types of radiation being measured.

Where one or more of the criteria are not met, the discrepancy will be reviewed and the reasons for acceptability of the data or the corrective actions taken to restore data acceptability will be documented.

10.0 Reporting

This section discusses the project reporting requirements.

10.1 Daily Field Reporting

CB&I will continue evaluating data collected in the field throughout the day. This analysis will be used to support the daily field reports, identify areas of concern and refine survey protocol as fieldwork progresses. The analysis will also be used to support the production of the survey completion report. If elevated survey readings are encountered, the event will be reported to the onsite Navy ombudsmen/liaisons and RASO immediately (Section 7.3.5).

Data will be compiled and submitted to the Navy as surveys are completed to document that fieldwork is being completed as expected. The reports will be submitted electronically by CB&I to the Navy Base Realignment and Closure Remedial Project Manager, Navy ROICC, and RASO Environmental Protection Manager by 10:00 a.m. PDT the following workday.

10.2 Survey Completion Report

Upon completion of the radiological investigation fieldwork and data analysis, a completion report will be prepared. The report will at a minimum include:

- A description of the fieldwork and the results of the analysis
- A preliminary screening evaluation of the analytical results collected during the fieldwork
- A discussion of the results that include an interpretation of the survey results, an assessment of the data and if it met the objectives of the survey, descriptions of uncertainties of the data collected
- A figure showing the dimensions of areas not accessible for surveys and a reason for the lack of survey access
- A discussion on background analysis
- Conclusions and recommendations based on the technical evaluation of the data collected

Additional information required to support conclusions and recommendations will also be included.

10.3 Human Health Risk Assessment

CB&I will conduct a human health risk assessment (HHRA) using the survey data collected for each housing unit based on the survey data collected and provide the results and conclusions and recommendations of the survey. The Navy will provide the threshold value to compare against the data. Once the HHRA is complete, CB&I will make recommendations to assist the Navy in decision-making for any future action to be taken in the IR Site 12 leasing area.

The HHRA will be included as an appendix to the survey completion report.

11.0 References

CB&I Federal Services LLC (CB&I), 2013, *Final Accident Prevention Plan, Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*.

CB&I, 2014a, *Final Work Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Naval Station Treasure Island, San Francisco, California*, May.

CB&I, 2014, *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California*, February.

Ludlum Measurements, Inc. 2013, www.ludlums.com.

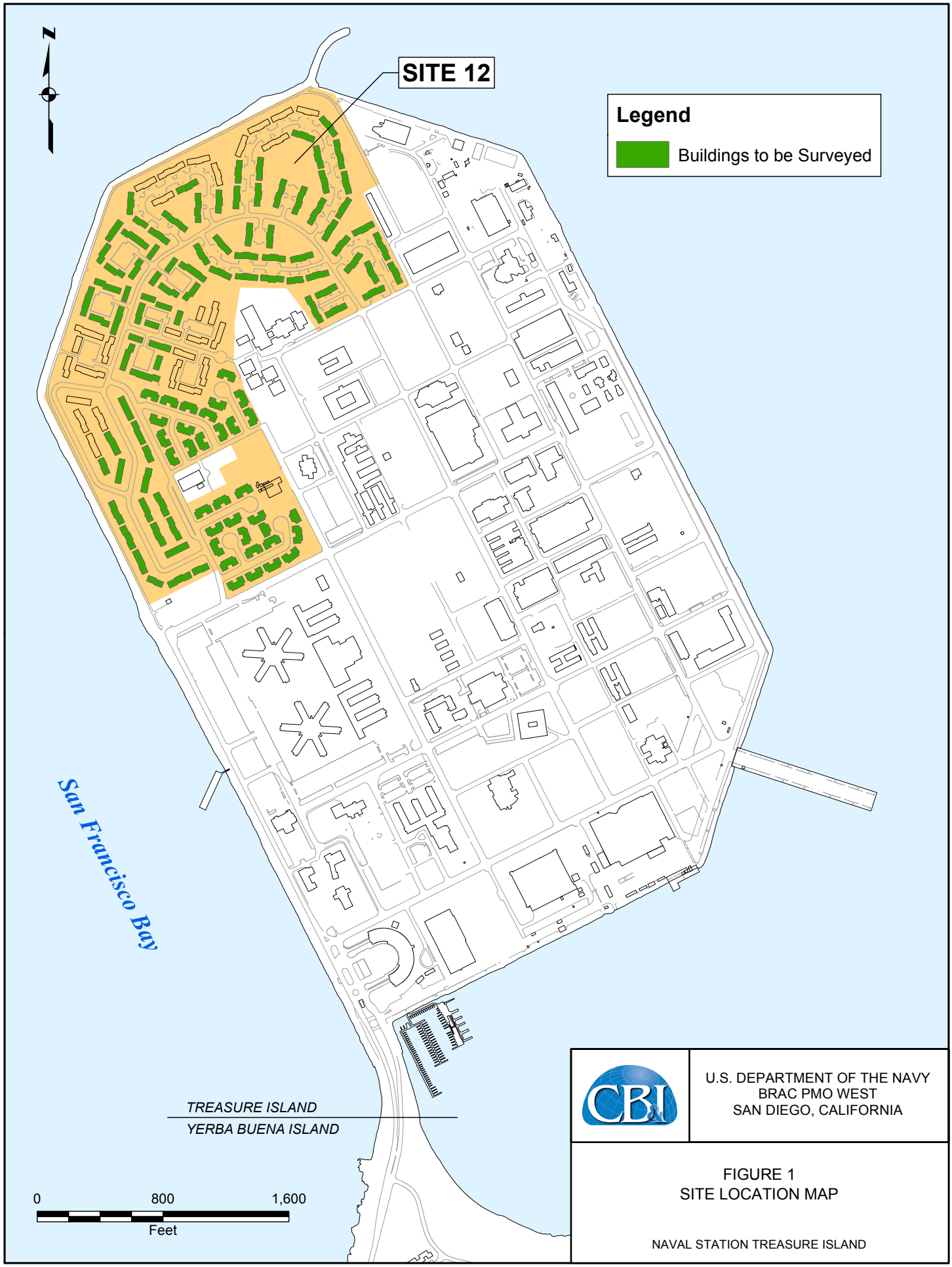
Ludlum Measurements, Inc., 2014, Personal Communication between Mr. Richard Smola, Director of Engineering, Ludlum Measurements, Inc., and Mr. John Hackett, CB&I Federal Services LLC, May 1.

Naval Facilities Engineering Command, 2012, *Unified Facilities Guide Specifications*, Section 01 35 26, "Governmental Safety Requirements."

Shaw Environmental, Inc., 2012, *Treasure Island Work Instruction*, TIWI-12-01, "Operation and Use of Portable Instruments at Treasure Island," October 29.

U.S. Army Corps of Engineers, 2008, *Safety and Health Requirements Manual, EM 385-1-1*, September 15.

Figures



U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 1
SITE LOCATION MAP

NAVAL STATION TREASURE ISLAND

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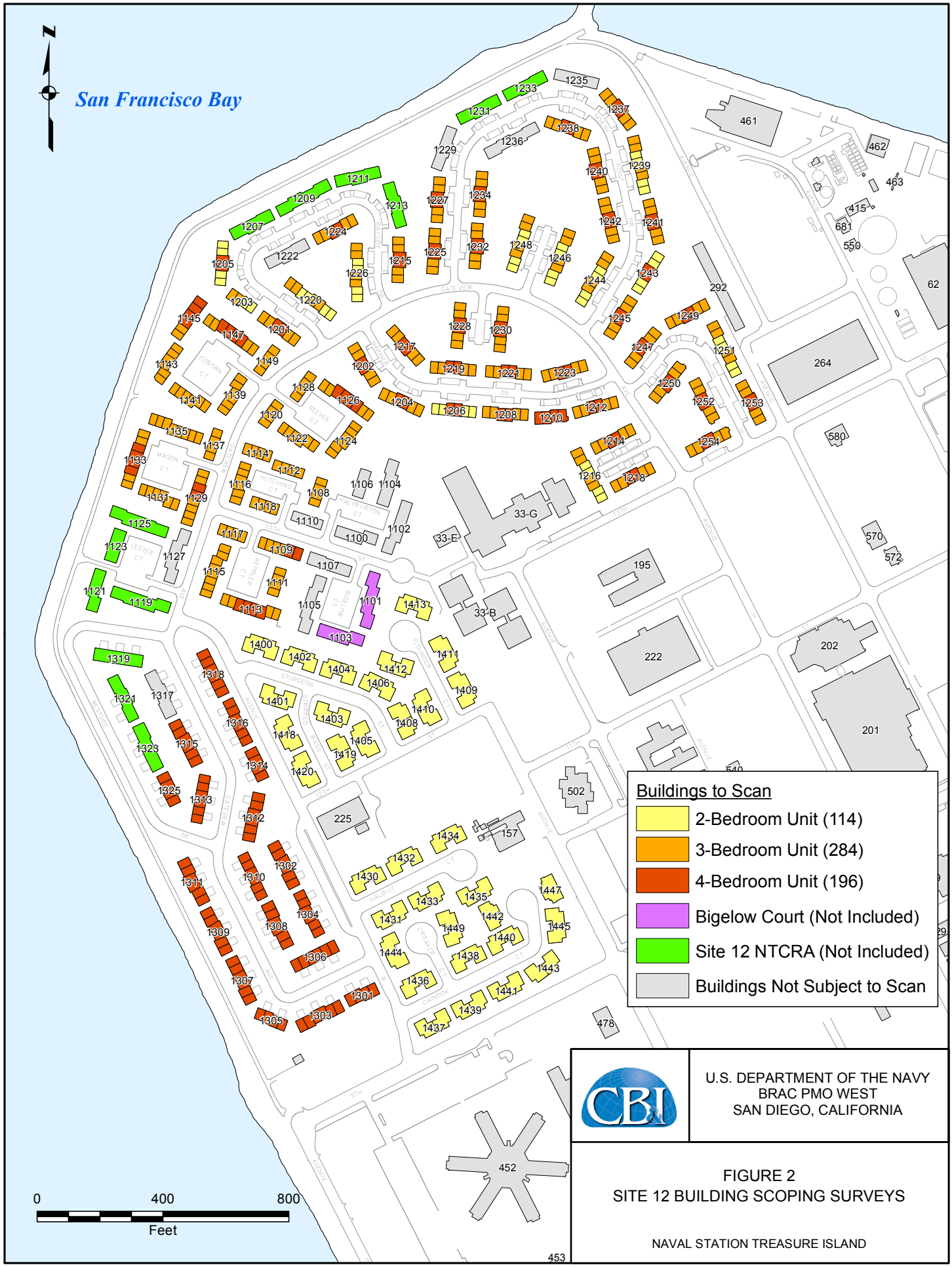

U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 2
SITE 12 BUILDING SCOPING SURVEYS

NAVAL STATION TREASURE ISLAND

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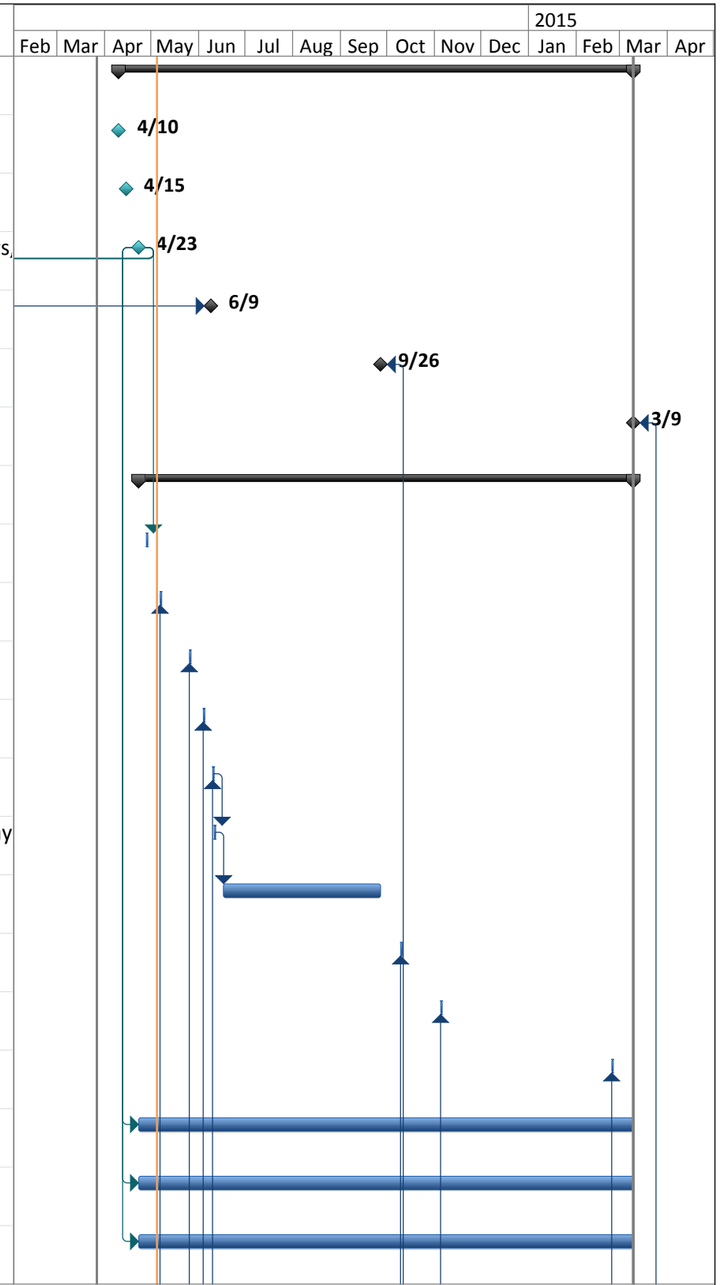
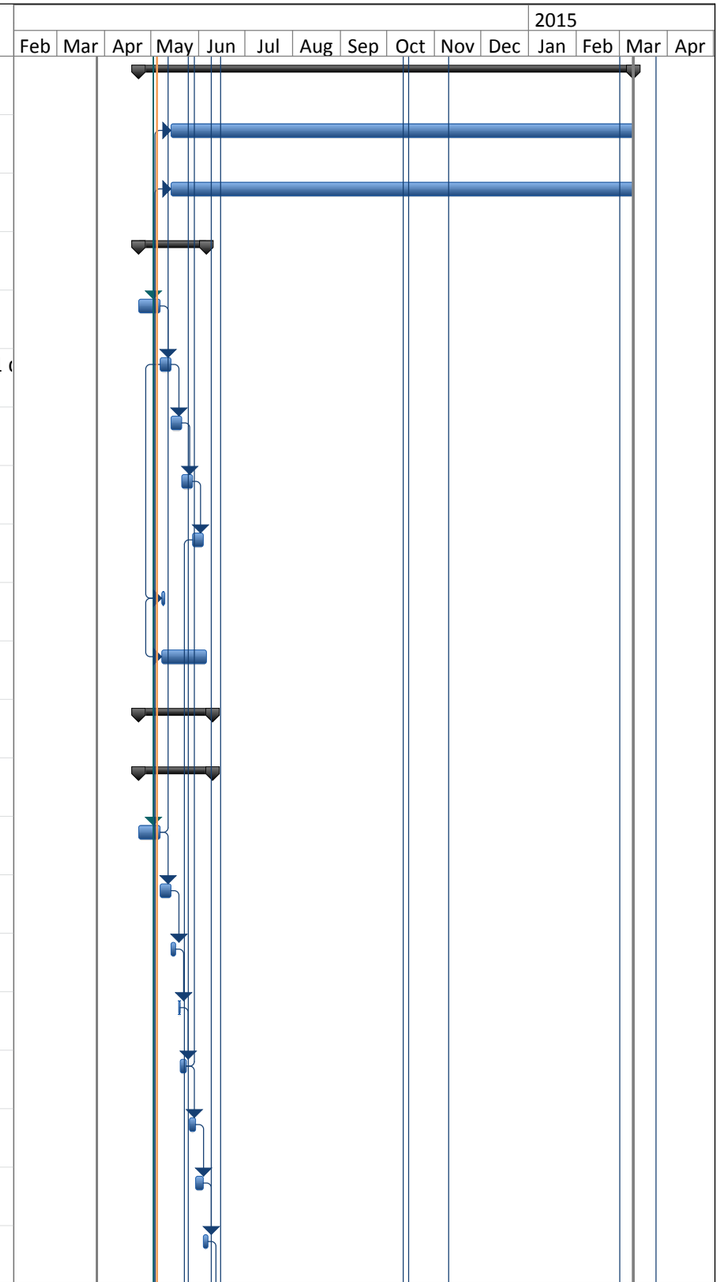
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
1		**Project Milestones**	**236 days**	**Thu 4/10/14**	**Mon 3/9/15**		
2		Proposal Submittal	0 days	Thu 4/10/14	Thu 4/10/14		
3		Revised Submittal Rev1	0 days	Tue 4/15/14	Tue 4/15/14		
4		Project Award	0 days	Wed 4/23/14	Wed 4/23/14		9FS+3 days,
5		Field Mobilization	0 days	Mon 6/9/14	Mon 6/9/14	72SS	
6		Field Demobilization	0 days	Fri 9/26/14	Fri 9/26/14	73FF	
7		Project Completion	0 days	Mon 3/9/15	Mon 3/9/15	121FF	
8		**WORK ELEMENT 1 – MEETINGS, PROJECT MANAGEMENT, AND ADMINISTRATIVE**	**227 days**	**Wed 4/23/14**	**Mon 3/9/15**		
9		Project Kick-off Meeting	1 day	Mon 4/28/14	Mon 4/28/14	4FS+3 days	
10		Internal Meeting on Task Specific Plan	1 day	Wed 5/7/14	Wed 5/7/14	35	
11		External Meeting on Task Specific Plan	1 day	Mon 5/26/14	Mon 5/26/14	39	
12		Meeting on resolving Response to Comments	1 day	Wed 6/4/14	Wed 6/4/14	51	
13		Orientation Session CB&I/Navy	1 day	Tue 6/10/14	Tue 6/10/14	43	14
14		Survey Kick-off Meeting	1 day	Wed 6/11/14	Wed 6/11/14	13	15FS+3 day
15		Meetings as necessary during fieldwork, including weekly QC meetings.	72 days	Tue 6/17/14	Fri 9/26/14	14FS+3 days	
16		Internal Meeting to present Survey Report to the Navy	1 day	Fri 10/10/14	Fri 10/10/14	109	
17		External Meeting to present Survey Report to the regulators	1 day	Wed 11/5/14	Wed 11/5/14	113	
18		Meeting to resolve Responses to Comments on the Survey Report	1 day	Tue 2/24/15	Tue 2/24/15	119	
19		Routine Meetings-BCT Meetings 1-9	227 days	Wed 4/23/14	Mon 3/9/15	4SS	
20		Project Management and Administrative Support	227 days	Wed 4/23/14	Mon 3/9/15	4SS	
21		Project Schedule	227 days	Wed 4/23/14	Mon 3/9/15	4SS	



Project: 2014 CTO 005 EMAC III R
Date: Mon 5/5/14
Figure 3

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

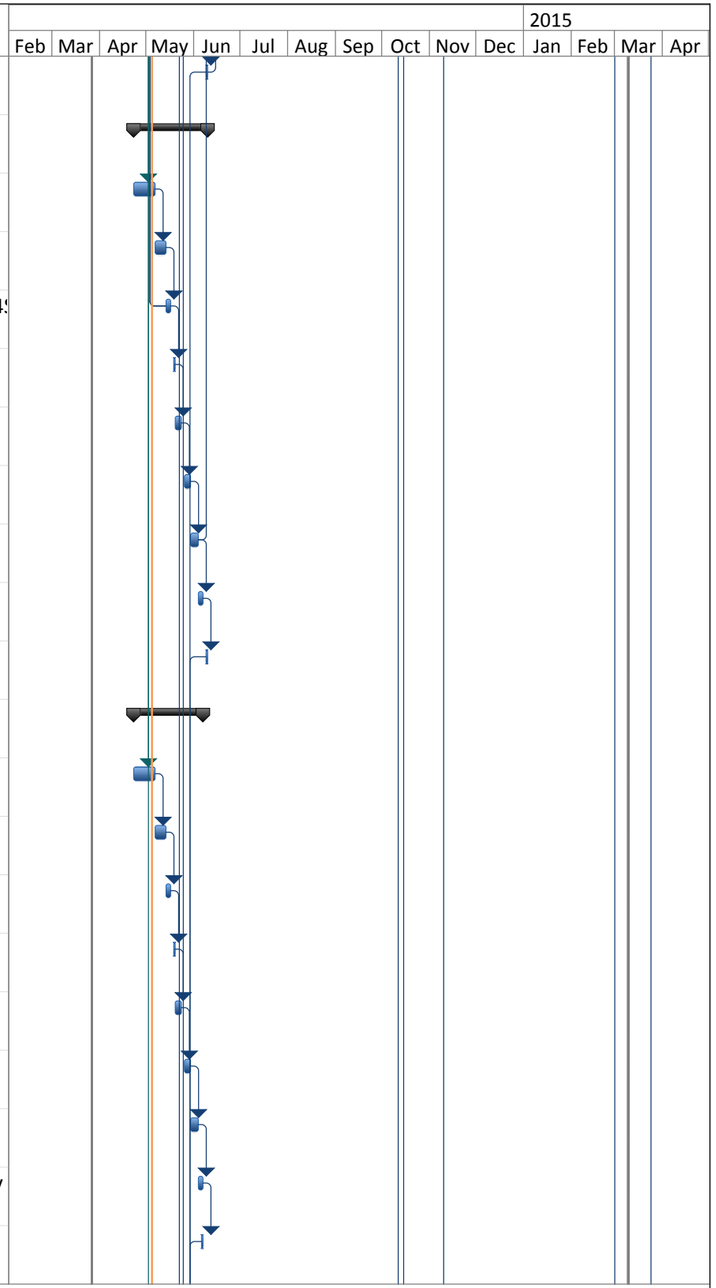
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
22		**WORK ELEMENT 2 – COMMUNITY OUTREACH SUPPORT**	**227 days**	**Wed 4/23/14**	**Mon 3/9/15**		
23		RAB Meetings 1-4	212 days	Wed 5/14/14	Mon 3/9/15	47SS	
24		Public Meetings 1-2	212 days	Wed 5/14/14	Mon 3/9/15	47SS	
25		**Fact Sheet and Work Notice**	**32 days**	**Wed 4/23/14**	**Thu 6/5/14**		
26		Draft Fact Sheet and Work Notice	10 days	Wed 4/23/14	Tue 5/6/14	4	27
27		Navy Review of Draft Fact Sheet and Work Notice	5 days	Wed 5/7/14	Tue 5/13/14	26	28,31SS+1
28		RTCs on Draft Fact Sheet and Work Notice and Issue Internal Final	5 days	Wed 5/14/14	Tue 5/20/14	27	29
29		Navy Review of RTCs/Internal Final	5 days	Wed 5/21/14	Tue 5/27/14	28	30
30		Finalize RTCs and Produce the Final Fact Sheet and Work Notice	5 days	Wed 5/28/14	Tue 6/3/14	29	72SS
31		Reconnaissance & Survey	2 days	Thu 5/8/14	Fri 5/9/14	27SS+1 day	32SS
32		Report Card	21 days	Thu 5/8/14	Thu 6/5/14	31SS	
33		**WORK ELEMENT 3 – PROJECT PLANS**	**34 days**	**Wed 4/23/14**	**Mon 6/9/14**		
34		**Task Specific Plan (TSP)**	**34 days**	**Wed 4/23/14**	**Mon 6/9/14**		
35		Internal Draft TSP	10 days	Wed 4/23/14	Tue 5/6/14	4	36,10
36		Navy Review of Internal Draft TSP	5 days	Wed 5/7/14	Tue 5/13/14	35	37
37		Response to Comments (RTCs) on Internal Draft TSP	3 days	Wed 5/14/14	Fri 5/16/14	36	38
38		Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	37	39
39		Finalize RTCs and Issue Draft TSP	4 days	Tue 5/20/14	Fri 5/23/14	38	40,11
40		Agency Review of Draft TSP	4 days	Mon 5/26/14	Thu 5/29/14	39	41
41		Response to Comments (RTCs) on Draft	3 days	Fri 5/30/14	Tue 6/3/14	40	42
42		Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	41	43



Project: 2014 CTO 005 EMAC III R
Date: Mon 5/5/14
Figure 3

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

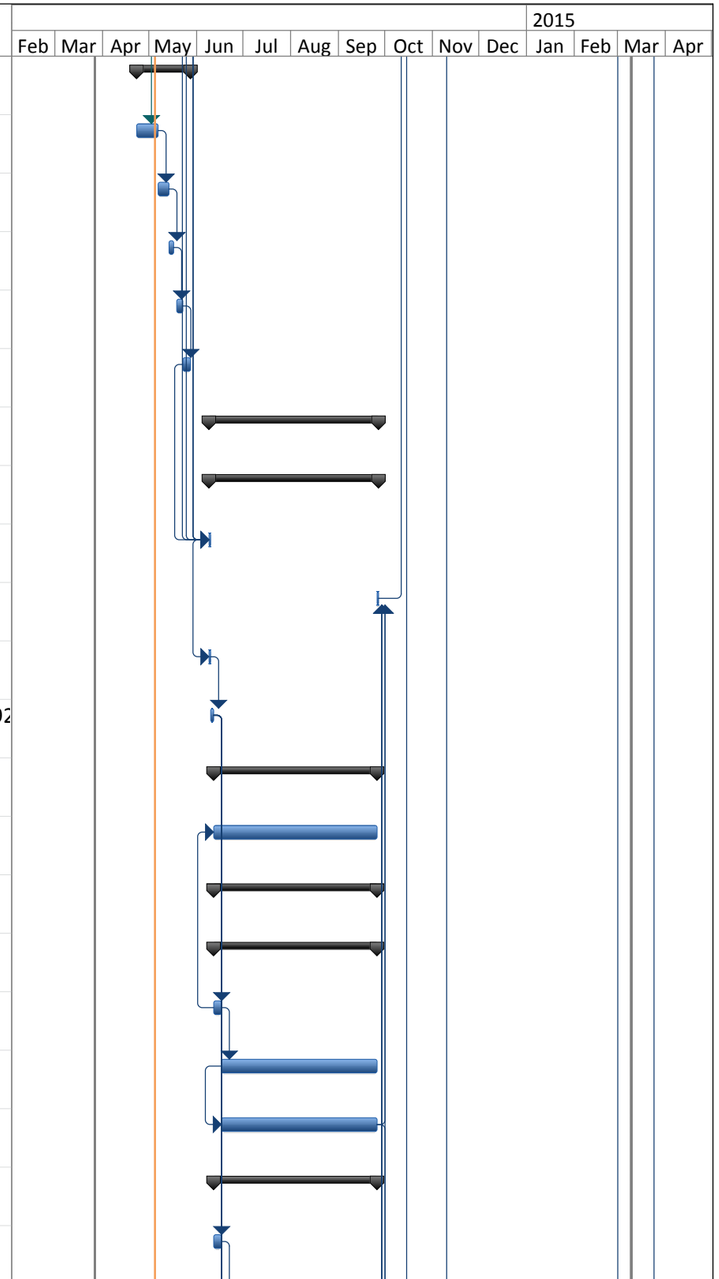
ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
43		Finalize RTCs and Issue Final TSP	1 day	Mon 6/9/14	Mon 6/9/14	42	72SS,13
44		**Data Management Plan**	**34 days**	**Wed 4/23/14**	**Mon 6/9/14**		
45		Internal Draft Data Management Plan	10 days	Wed 4/23/14	Tue 5/6/14	4	46
46		Navy Review of Internal Draft Data Management Plan	5 days	Wed 5/7/14	Tue 5/13/14	45	47
47		Response to Comments (RTCs) on Internal Draft Data Management Plan	3 days	Wed 5/14/14	Fri 5/16/14	46	48,23SS,24
48		Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	47	49
49		Finalize RTCs and Issue Draft Data Management Plan	4 days	Tue 5/20/14	Fri 5/23/14	48	50
50		Agency Review of Draft Data Management Plan	4 days	Mon 5/26/14	Thu 5/29/14	49	51
51		Response to Comments (RTCs) on Draft	3 days	Fri 5/30/14	Tue 6/3/14	50	52,12
52		Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	51	53
53		Finalize RTCs and Issue Final Data Management Plan	1 day	Mon 6/9/14	Mon 6/9/14	52	72SS
54		**Contractor Quality Control Plan (CQC)**	**33 days**	**Wed 4/23/14**	**Fri 6/6/14**		
55		Internal Draft CQC	10 days	Wed 4/23/14	Tue 5/6/14	4	56
56		Navy Review of Internal Draft CQC	5 days	Wed 5/7/14	Tue 5/13/14	55	57
57		Response to Comments (RTCs) on Internal Draft CQC	3 days	Wed 5/14/14	Fri 5/16/14	56	58
58		Navy Review of RTCs (reduced to 1 day)	1 day	Mon 5/19/14	Mon 5/19/14	57	59
59		Finalize RTCs and Issue Draft CQC	4 days	Tue 5/20/14	Fri 5/23/14	58	60
60		Agency Review of Draft CQC	4 days	Mon 5/26/14	Thu 5/29/14	59	61
61		Response to Comments (RTCs) on Draft	3 days	Fri 5/30/14	Tue 6/3/14	60	62
62		Navy/Agency Review of RTCs	3 days	Wed 6/4/14	Fri 6/6/14	61	63FS-1 day
63		Finalize RTCs and Issue Final CQC	1 day	Fri 6/6/14	Fri 6/6/14	62FS-1 day	72SS



Project: 2014 CTO 005 EMAC III R
Date: Mon 5/5/14
Figure 3

Task
Split
Milestone
Summary
Project Summary
External Tasks
External Milestone
Inactive Task
Inactive Milestone
Inactive Summary
Manual Task
Duration-only
Manual Summary Rollup
Manual Summary
Start-only
Finish-only
Deadline
Progress

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
64		**Health and Safety Plan (HSP)**	**25 days**	**Wed 4/23/14**	**Tue 5/27/14**		
65		Internal Draft HSP	10 days	Wed 4/23/14	Tue 5/6/14	4	66
66		Navy Review of Internal Draft HSP	5 days	Wed 5/7/14	Tue 5/13/14	65	67
67		Response to Comments (RTCs) on Internal Draft HSP	3 days	Wed 5/14/14	Fri 5/16/14	66	68
68		Navy Review of RTCs	4 days	Mon 5/19/14	Thu 5/22/14	67	69
69		Finalize RTCs and Issue Final HSP	3 days	Fri 5/23/14	Tue 5/27/14	68	72SS
70		**WORK ELEMENT 4 – FIELD WORK**	**78 days**	**Mon 6/9/14**	**Fri 9/26/14**		
71		**Mobilization and Demobilization**	**78 days**	**Mon 6/9/14**	**Fri 9/26/14**		
72		Mobilization	1 day	Mon 6/9/14	Mon 6/9/14	30SS,43SS,53	5SS,74SS
73		Demobilization	1 day	Fri 9/26/14	Fri 9/26/14	82,86,90,94,9	6FF
74		New Hire Orientation/Training	1 day	Mon 6/9/14	Mon 6/9/14	72SS	75
75		Task Specific Training	2 days	Tue 6/10/14	Wed 6/11/14	74	80,84,88,92
76		**Site Maintenance**	**74 days**	**Thu 6/12/14**	**Thu 9/25/14**		
77		Ongoing Site Maintenance	74 days	Thu 6/12/14	Thu 9/25/14	80SS	
78		**Site Work**	**74 days**	**Thu 6/12/14**	**Thu 9/25/14**		
79		**Team 1**	**74 days**	**Thu 6/12/14**	**Thu 9/25/14**		
80		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	81,77SS
81		Removal of Furniture	71 days	Tue 6/17/14	Thu 9/25/14	80	82SS
82		Radiological Scoping Surveys	71 days	Tue 6/17/14	Thu 9/25/14	81SS	73,109
83		**Team 2**	**74 days**	**Thu 6/12/14**	**Thu 9/25/14**		
84		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	85



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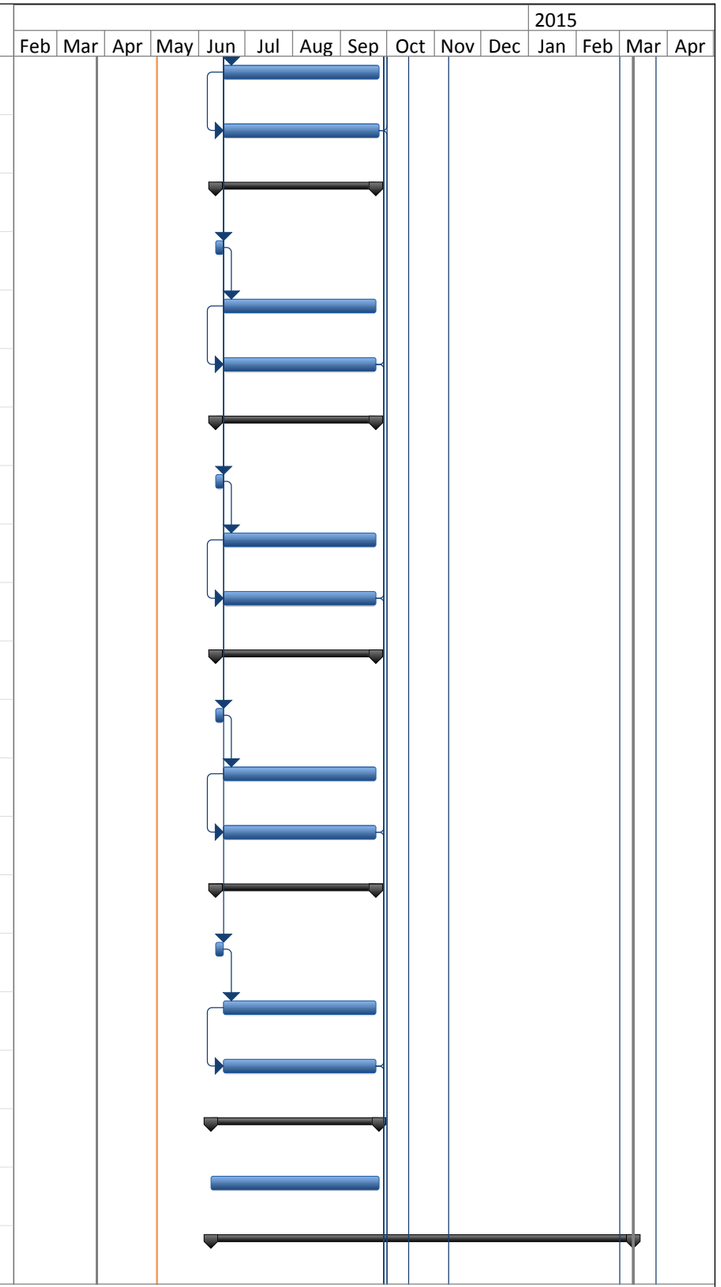
Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	
Summary	Inactive Task	Duration-only	Finish-only	

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
85		Removal of Furniture	71 days	Tue 6/17/14	Thu 9/25/14	84	86SS
86		Radiological Scoping Surveys	71 days	Tue 6/17/14	Thu 9/25/14	85SS	73,109
87		**Team 3**	**72 days**	**Thu 6/12/14**	**Tue 9/23/14**		
88		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	89
89		Removal of Furniture	69 days	Tue 6/17/14	Tue 9/23/14	88	90SS
90		Radiological Scoping Surveys	69 days	Tue 6/17/14	Tue 9/23/14	89SS	73,109
91		**Team 4**	**72 days**	**Thu 6/12/14**	**Tue 9/23/14**		
92		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	93
93		Removal of Furniture	69 days	Tue 6/17/14	Tue 9/23/14	92	94SS
94		Radiological Scoping Surveys	69 days	Tue 6/17/14	Tue 9/23/14	93SS	73,109
95		**Team 5**	**72 days**	**Thu 6/12/14**	**Tue 9/23/14**		
96		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	97
97		Removal of Furniture	69 days	Tue 6/17/14	Tue 9/23/14	96	98SS
98		Radiological Scoping Surveys	69 days	Tue 6/17/14	Tue 9/23/14	97SS	73,109
99		**Team 6**	**72 days**	**Thu 6/12/14**	**Tue 9/23/14**		
100		Radiological Scoping Surveys Empty Units	3 days	Thu 6/12/14	Mon 6/16/14	75	101
101		Removal of Furniture	69 days	Tue 6/17/14	Tue 9/23/14	100	102SS
102		Radiological Scoping Surveys	69 days	Tue 6/17/14	Tue 9/23/14	101SS	73,109
103		**Field Work Reports and QC Meetings**	**77 days**	**Mon 6/9/14**	**Thu 9/25/14**		
104		Ongoing Field Work Reports and QC Meetings	77 days	Mon 6/9/14	Thu 9/25/14		
105		**WORK ELEMENT 5 – DATA ANALYSIS AND SURVEY COMPLETION REPORT**	**194 days**	**Mon 6/9/14**	**Mon 3/9/15**		



Project: 2014 CTO 005 EMAC III R
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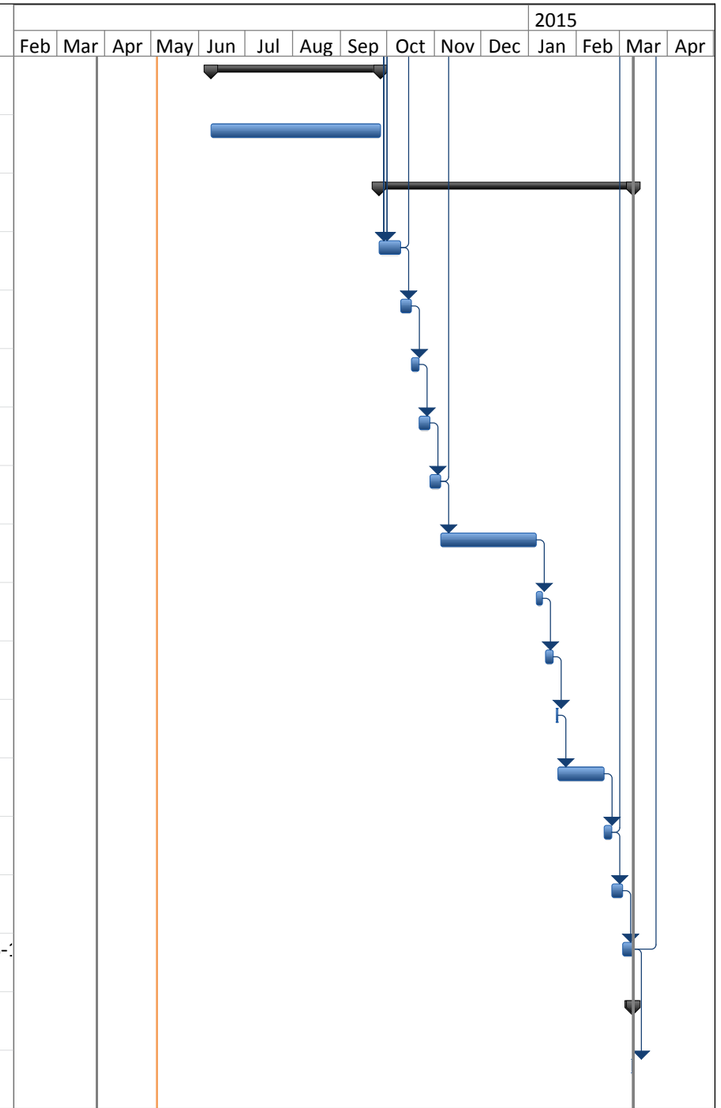
Figure 3

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline			
Split	External Tasks	Inactive Summary	Manual Summary	Progress			
Milestone	External Milestone	Manual Task	Start-only				
Summary	Inactive Task	Duration-only	Finish-only				

ID	Task Mode	Task Name	Duration	Start	Finish	Predecessors	Successors
106		**Data Analysis**	**78 days**	**Mon 6/9/14**	**Fri 9/26/14**		
107		Data Analysis	78 days	Mon 6/9/14	Fri 9/26/14		
108		**Survey Completion Report**	**117 days**	**Fri 9/26/14**	**Mon 3/9/15**		
109		Internal Draft Survey Completion Report	10 days	Fri 9/26/14	Thu 10/9/14	82,86,90,94,9	110,16
110		Navy Review of Internal Draft Survey Completion Report	5 days	Fri 10/10/14	Thu 10/16/14	109	111
111		Response to Comments (RTCs) on Internal Draft Survey Completion Report	3 days	Fri 10/17/14	Tue 10/21/14	110	112
112		Navy Review of RTCs (assumed duration)	5 days	Wed 10/22/14	Tue 10/28/14	111	113
113		Finalize RTCs and Issue Draft Survey Completion Report	5 days	Wed 10/29/14	Tue 11/4/14	112	114,17
114		Agency Review of Draft Survey Completion Report	44 days	Wed 11/5/14	Mon 1/5/15	113	115
115		Response to Comments (RTCs) - Agency/RAB Comments	4 days	Tue 1/6/15	Fri 1/9/15	114	116
116		Navy Review of RTCs (assumed duration)	5 days	Mon 1/12/15	Fri 1/16/15	115	117
117		Finalize RTCs and Issue Draft Final Survey Completion Report	1 day	Mon 1/19/15	Mon 1/19/15	116	118
118		Agency Review of Draft Final Survey Completion Report	22 days	Tue 1/20/15	Wed 2/18/15	117	119
119		Response to Comments (RTCs) - Agency/RAB Comments	3 days	Thu 2/19/15	Mon 2/23/15	118	120,18
120		Navy/Agency Review of RTCs (assumed duration)	5 days	Tue 2/24/15	Mon 3/2/15	119	121
121		Finalize RTCs and Issue Final Survey Completion Report	5 days	Tue 3/3/15	Mon 3/9/15	120	7FF,123FS-1
122		**Records Management**	**1 day**	**Mon 3/9/15**	**Mon 3/9/15**		
123		Submit all documentation	1 day	Mon 3/9/15	Mon 3/9/15	121FS-1 day	



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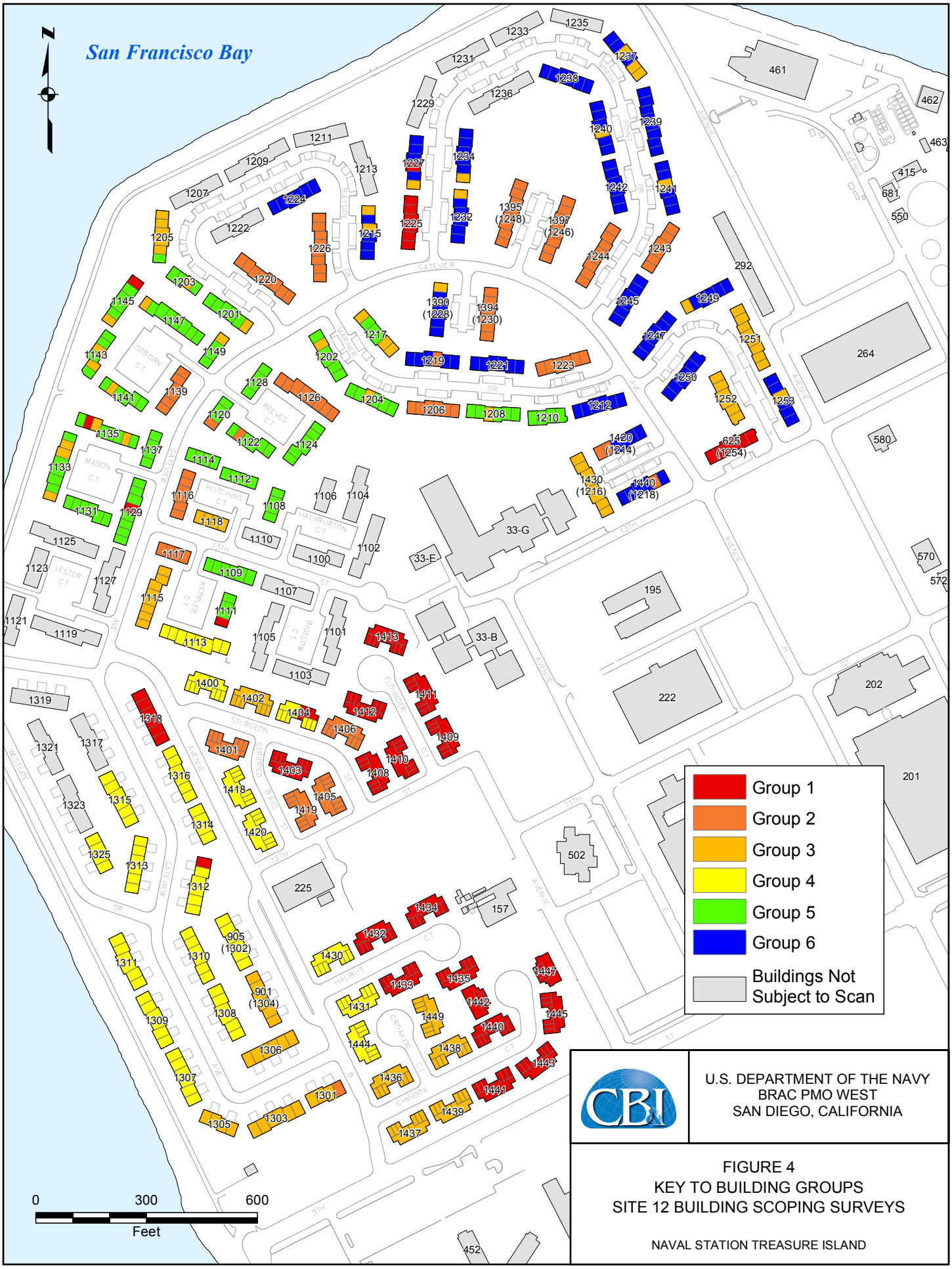
Split	External Tasks	Inactive Summary	Manual Summary	Progress			
Milestone	External Milestone	Manual Task	Start-only				
Summary	Inactive Task	Duration-only	Finish-only				



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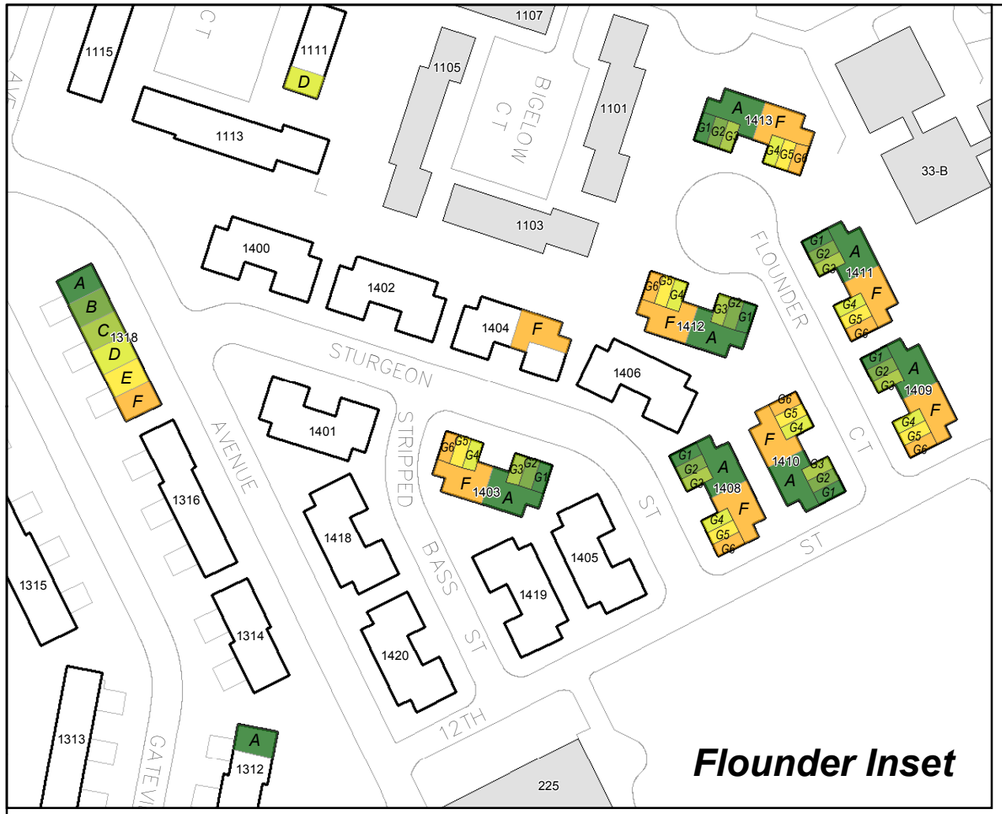

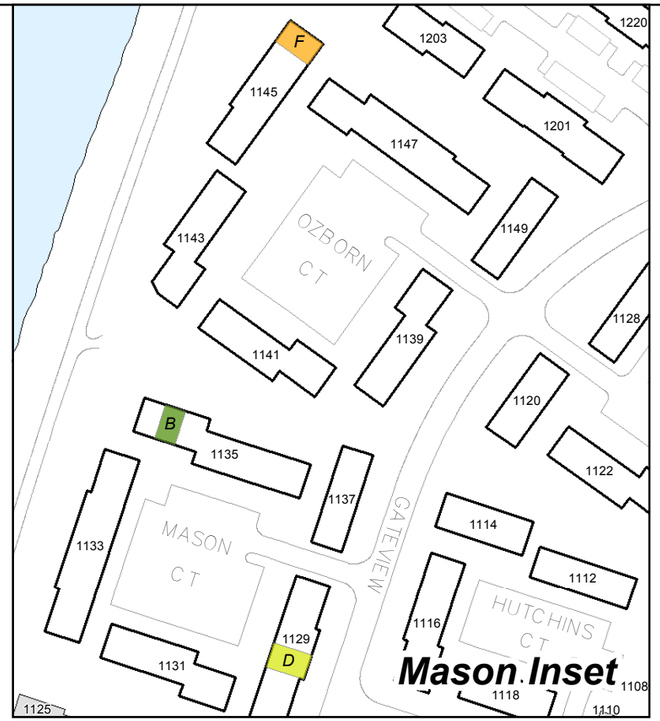

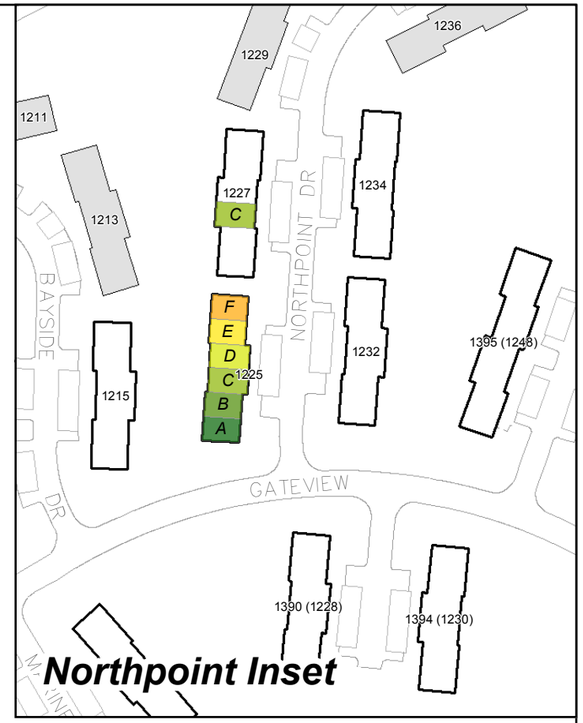

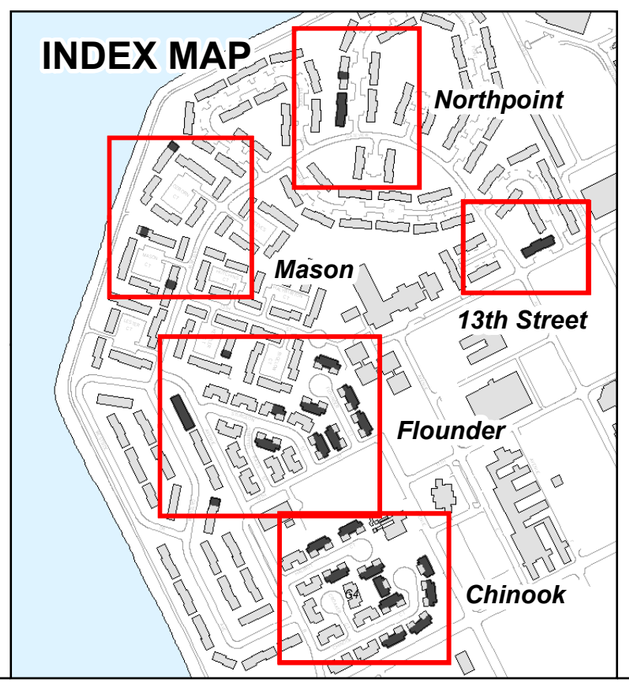

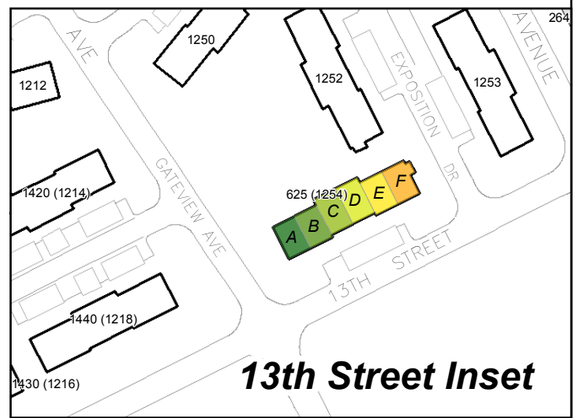

Key to Building Units and Garages

A/G1	D/G4
B/G2	E/G5
C/G3	F/G6

0 150 300
Feet

N

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FIGURE 5
MAP OF BUILDING UNITS
GROUP 1 (59 UNITS, 98 GARAGES)

NAVAL STATION TREASURE ISLAND

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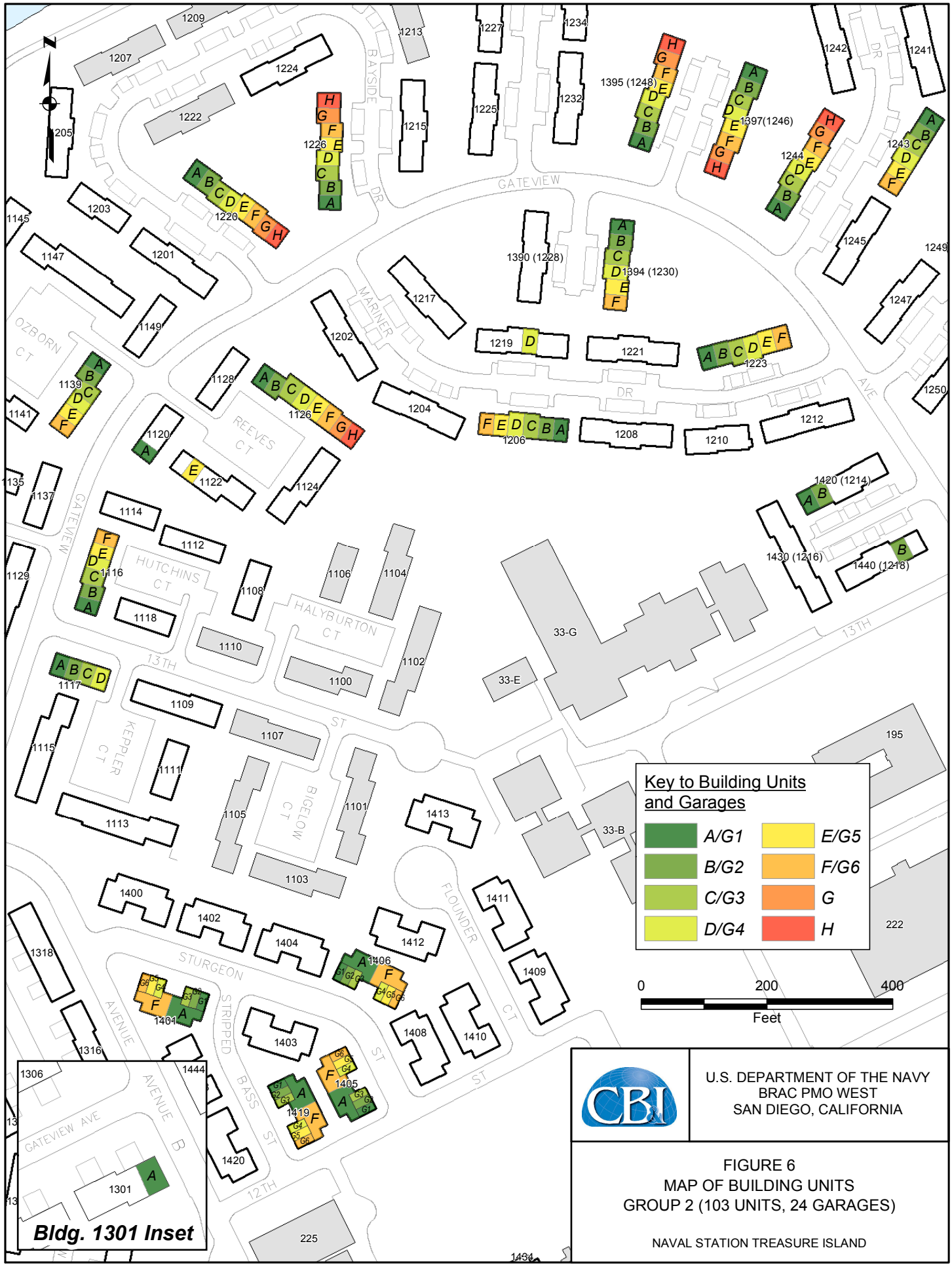

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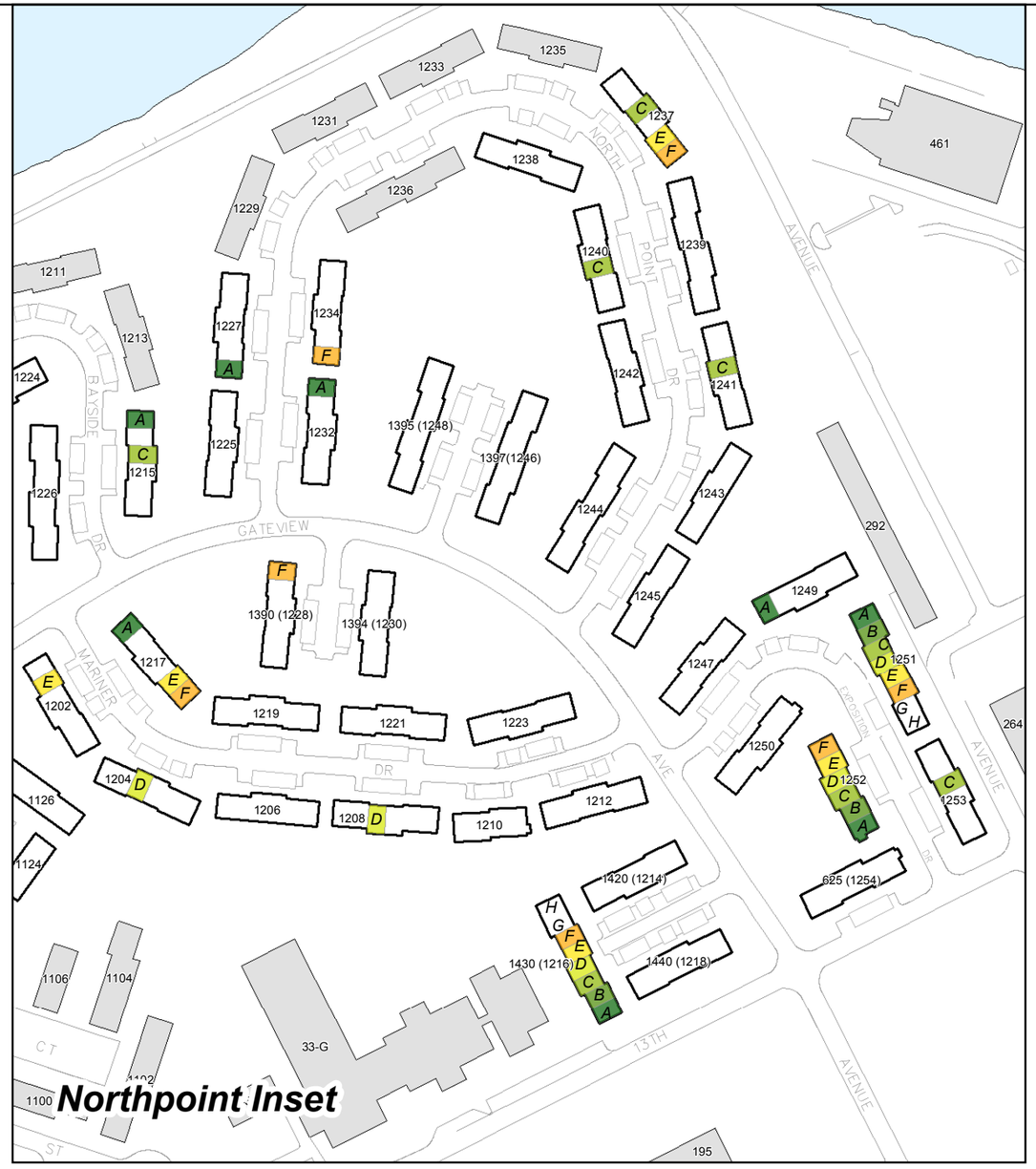
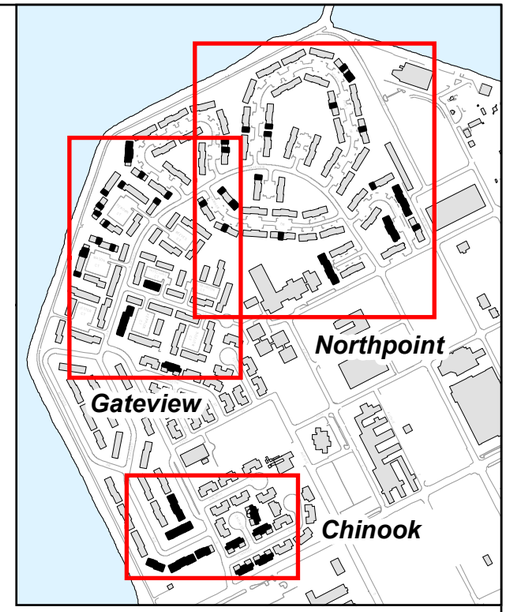
FIGURE 6
MAP OF BUILDING UNITS
GROUP 2 (103 UNITS, 24 GARAGES)

NAVAL STATION TREASURE ISLAND





INDEX MAP

Key to Building Units and Garages

A/G1	D/G4
B/G2	E/G5
C/G3	F/G6

N

0 200 400
Feet

U.S. DEPARTMENT OF THE NAVY
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FIGURE 7
MAP OF BUILDING UNITS
GROUP 3 (108 UNITS, 36 GARAGES)

NAVAL STATION TREASURE ISLAND

C:\GIS\Treasure_Island\GIS_Documents\Project_Maps\CTO5_BldgScans\TI_CTO5_009_Group3_units.mxd 06/06/14

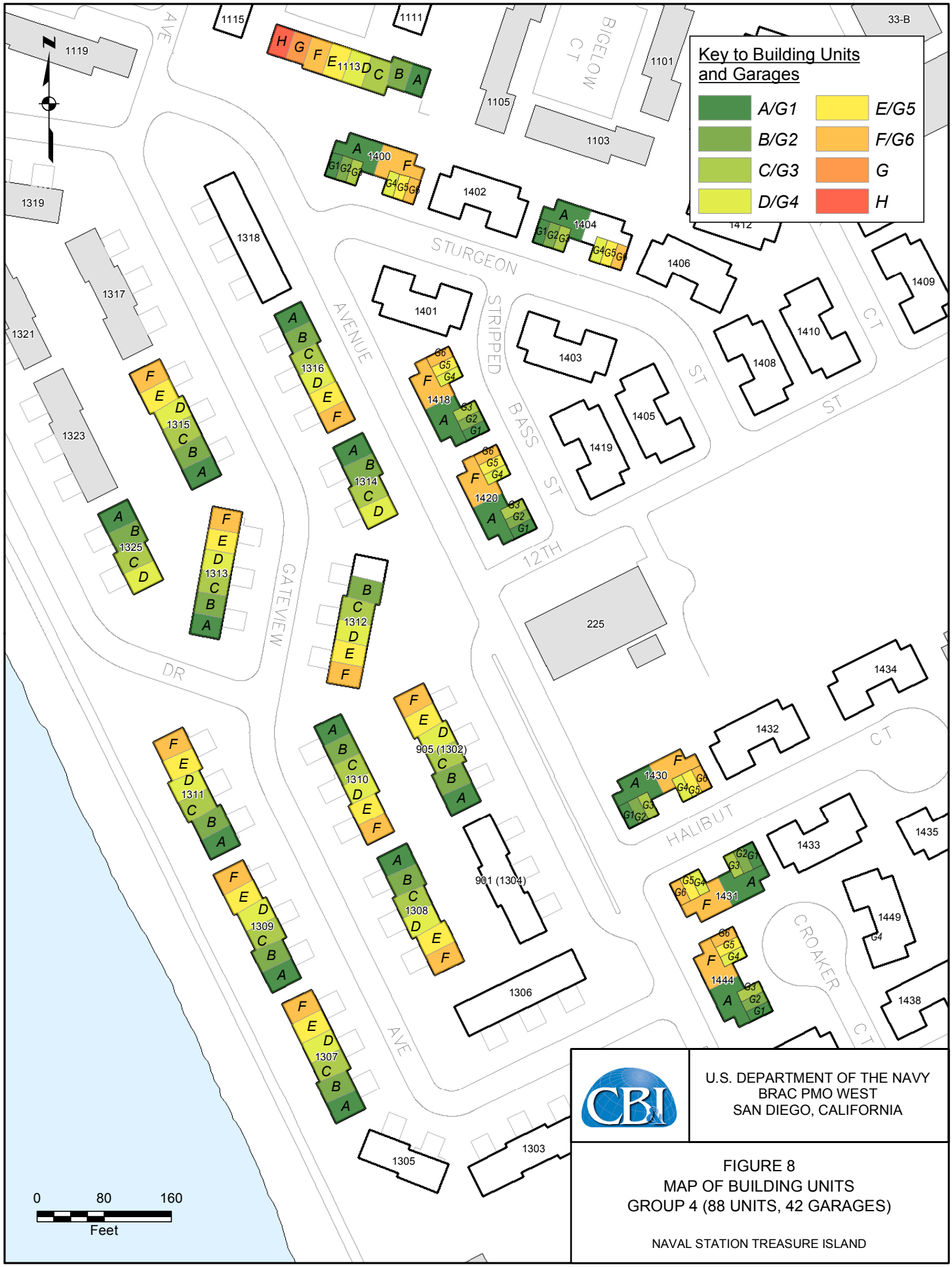

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FIGURE 9
MAP OF BUILDING UNITS
GROUP 5 (120 UNITS)

NAVAL STATION TREASURE ISLAND

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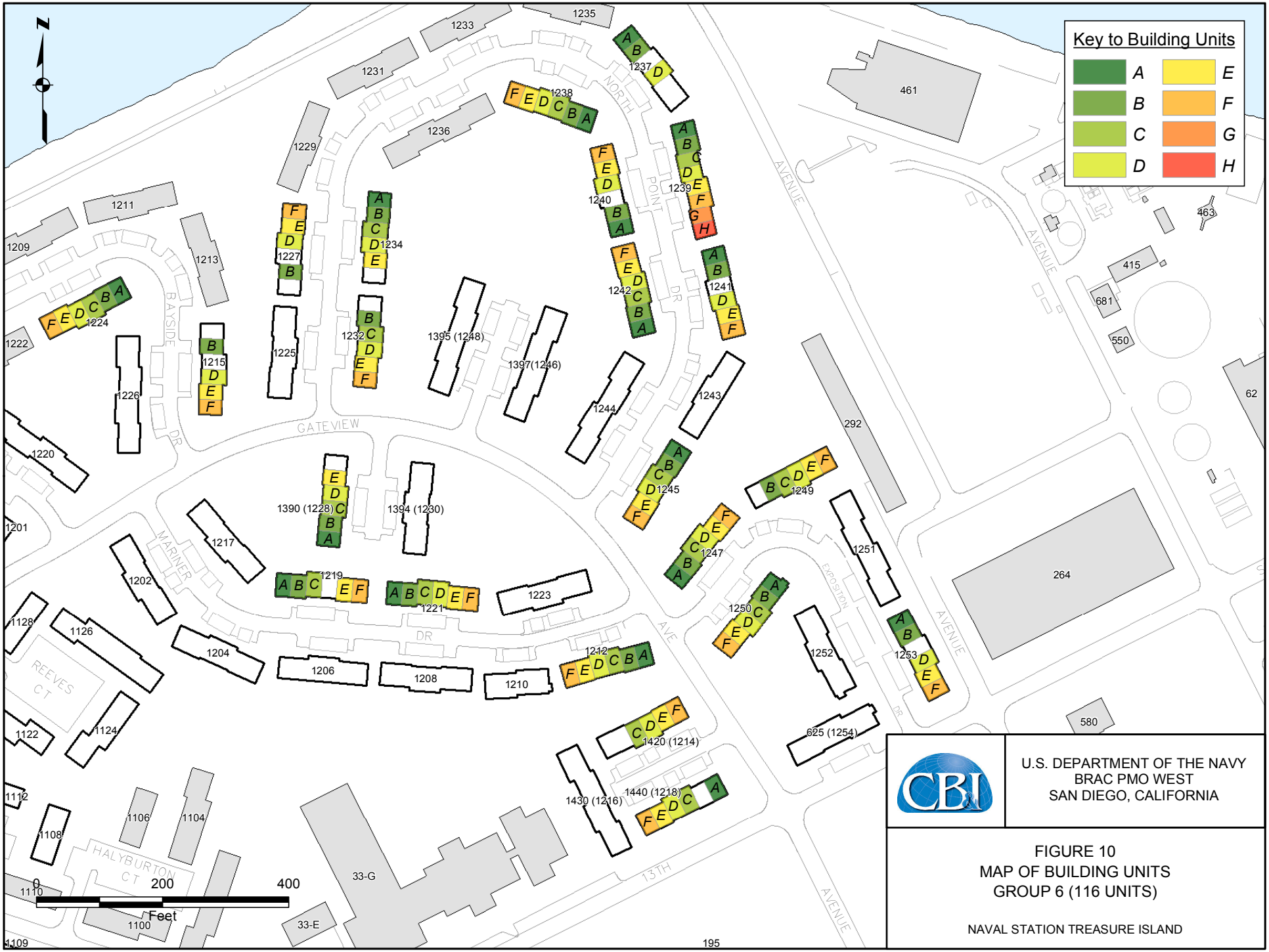

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IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

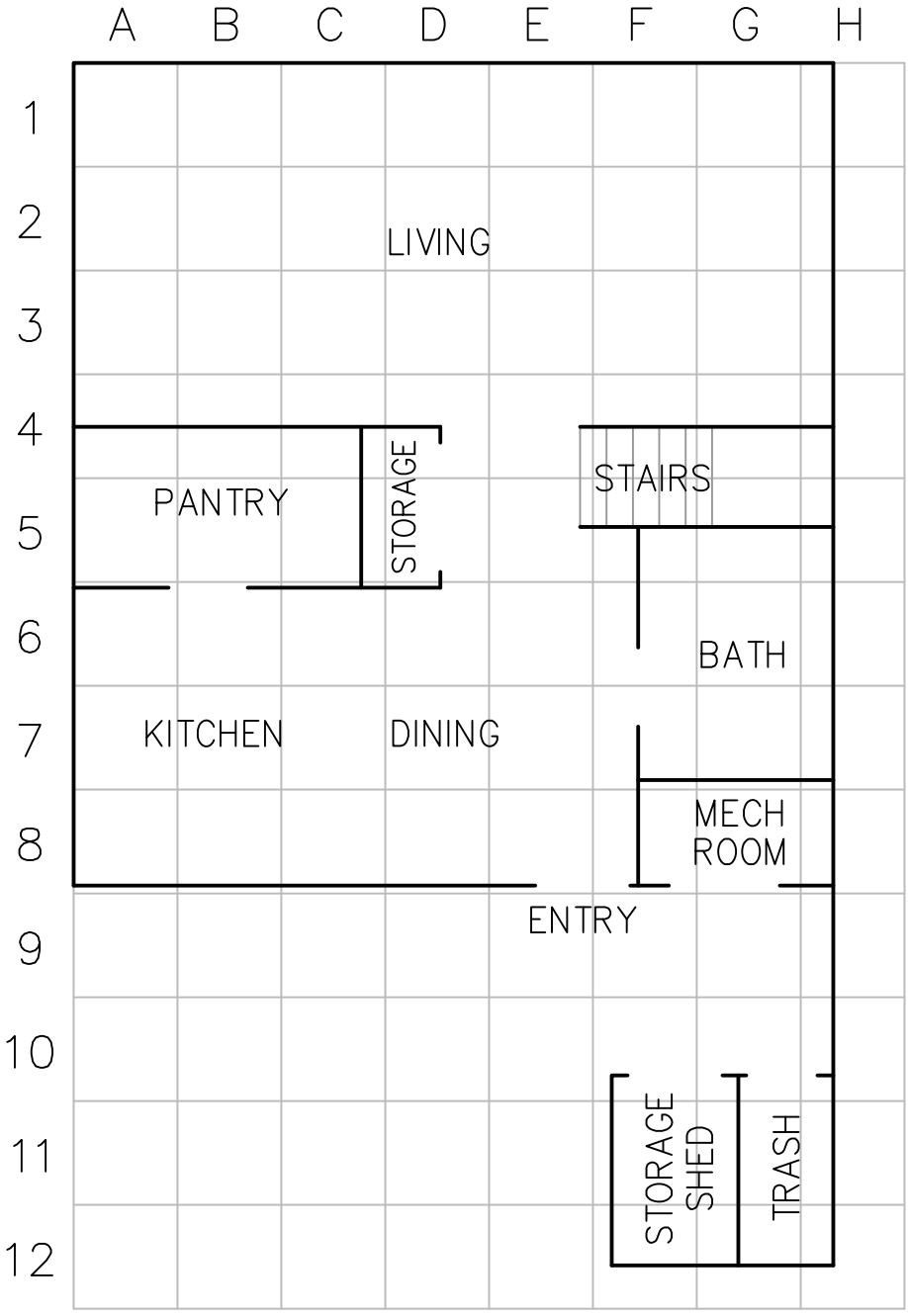

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FIGURE 11
UNIT LAYOUT
1100 SERIES
3-BEDROOM, CORNER KITCHEN
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

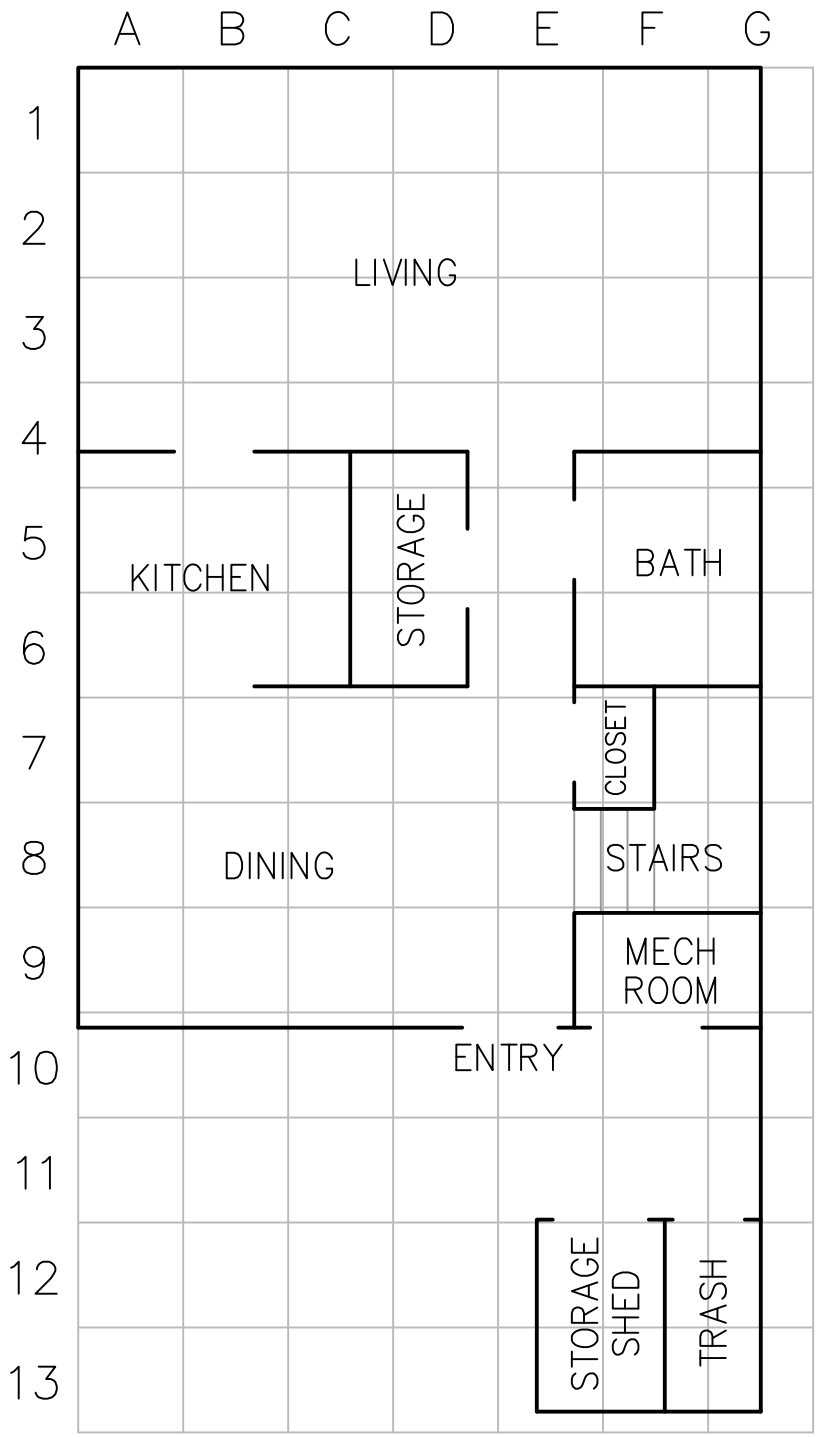

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FIGURE 12
UNIT LAYOUT
1100 SERIES
3-BEDROOM, CENTER KITCHEN
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

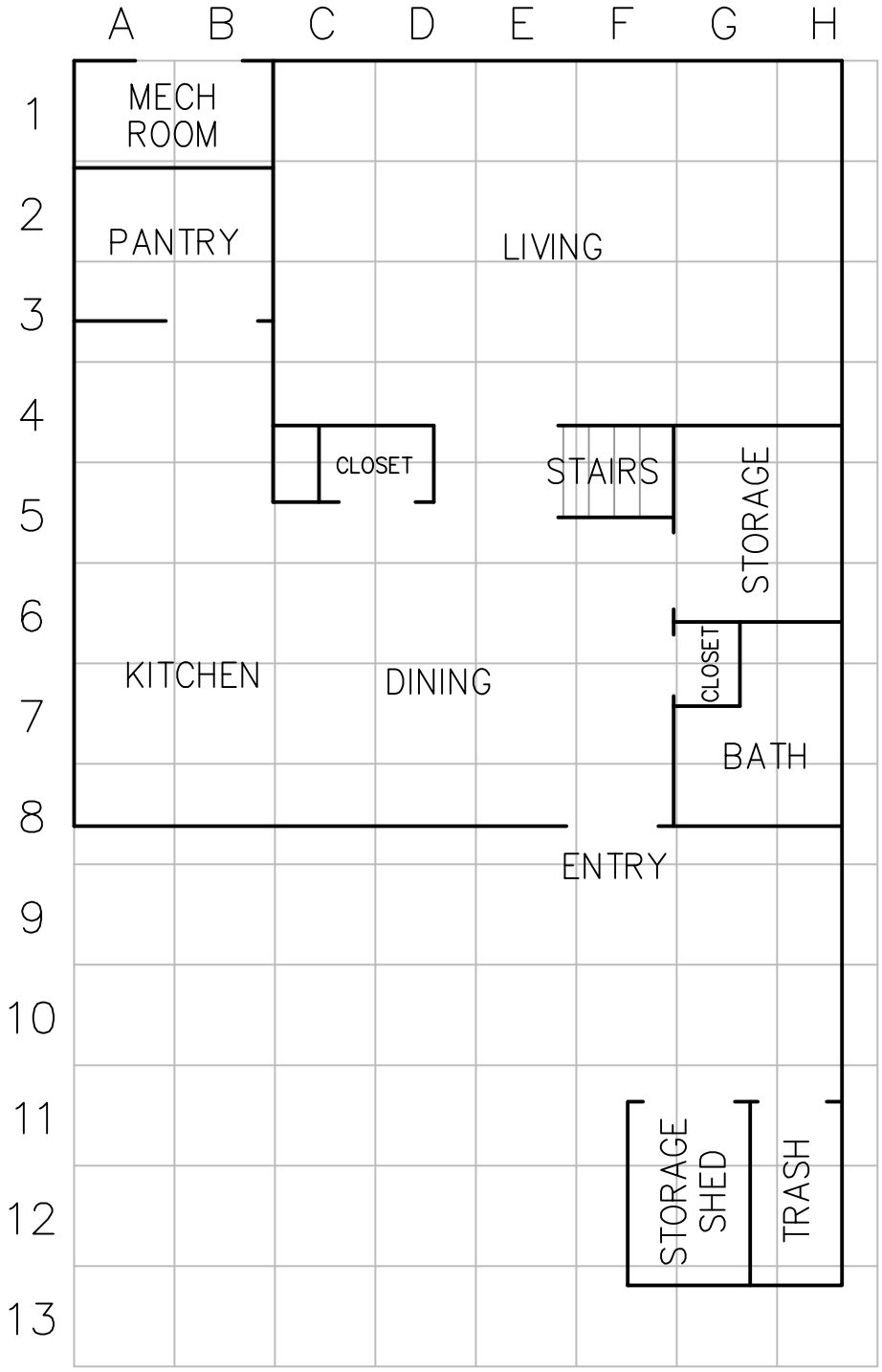

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FIGURE 13
UNIT LAYOUT
1100 SERIES
4-BEDROOM

NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

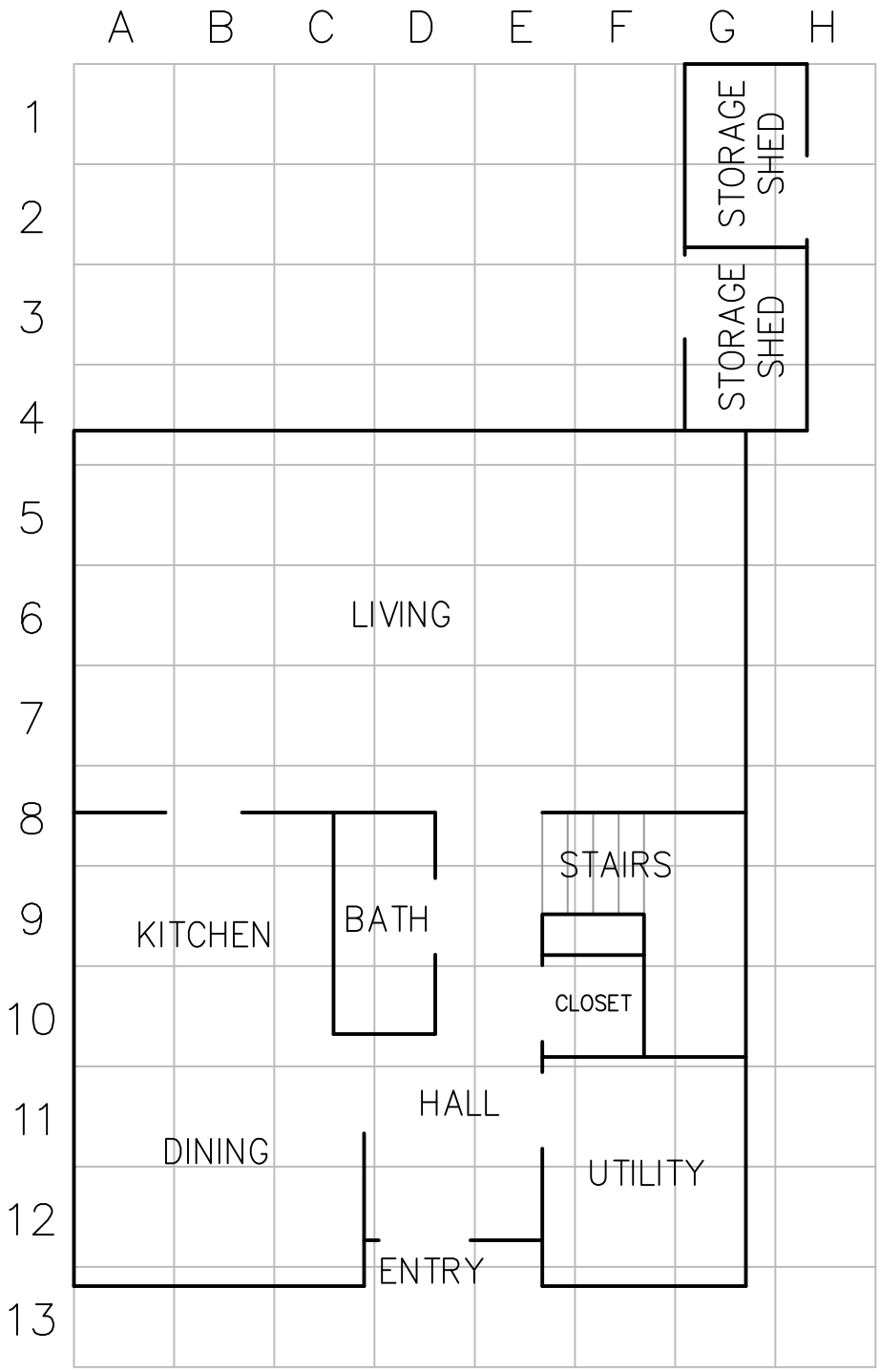

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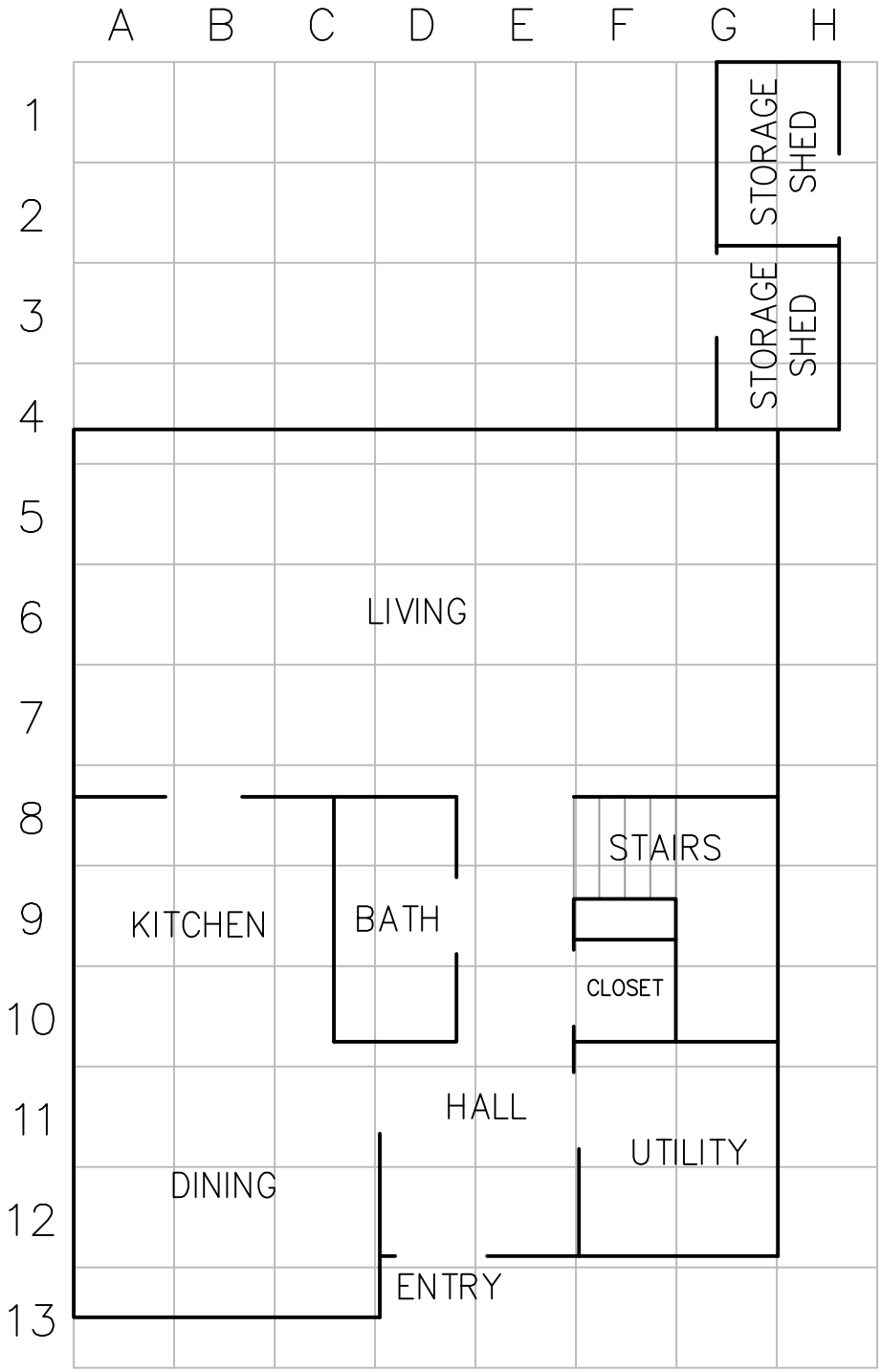
FIGURE 14
UNIT LAYOUT
1200 SERIES
2-BEDROOM
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1



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SAN DIEGO, CALIFORNIA

FIGURE 15
UNIT LAYOUT
1200 SERIES
3-BEDROOM
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

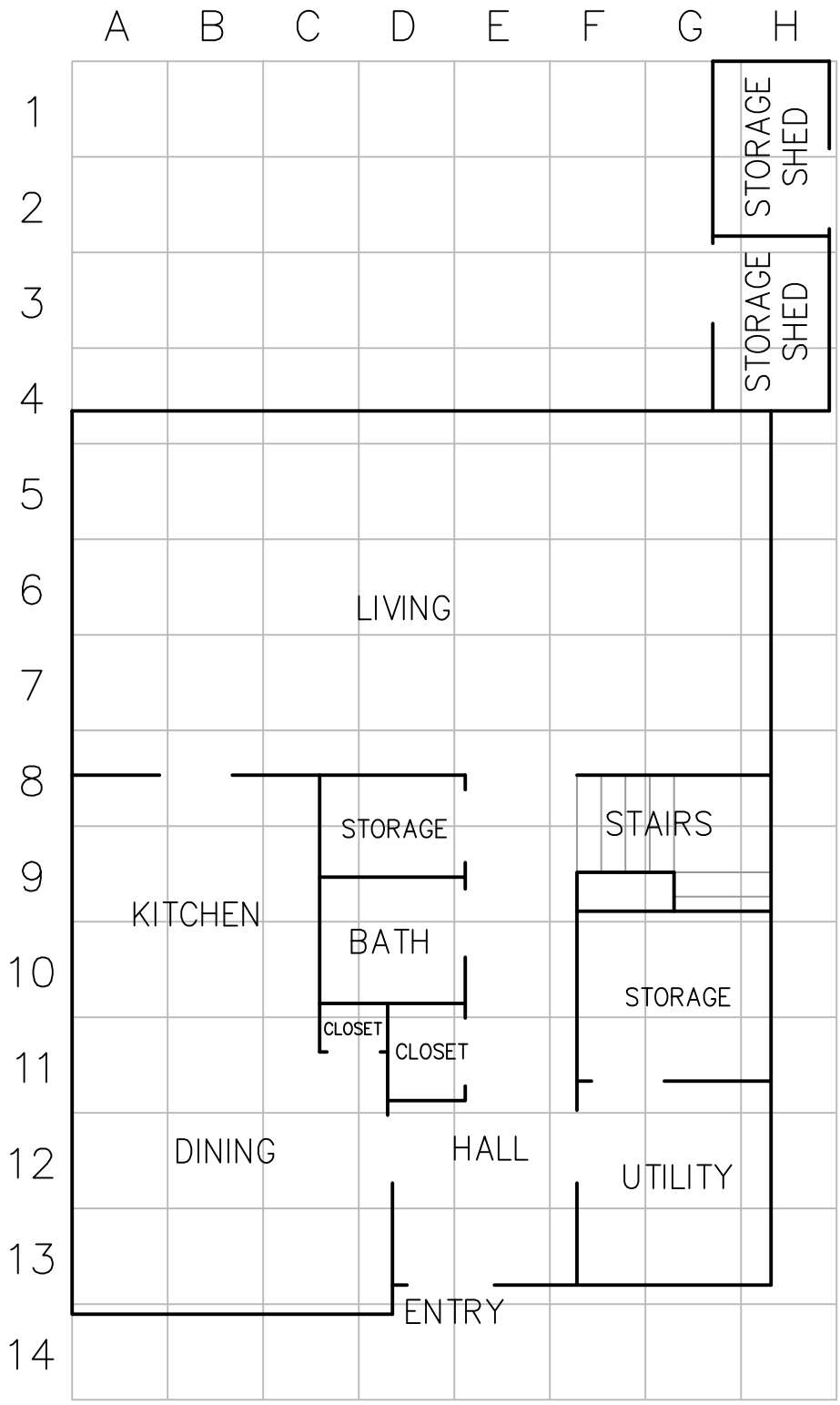

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FIGURE 16
UNIT LAYOUT
1200 SERIES
4-BEDROOM
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1

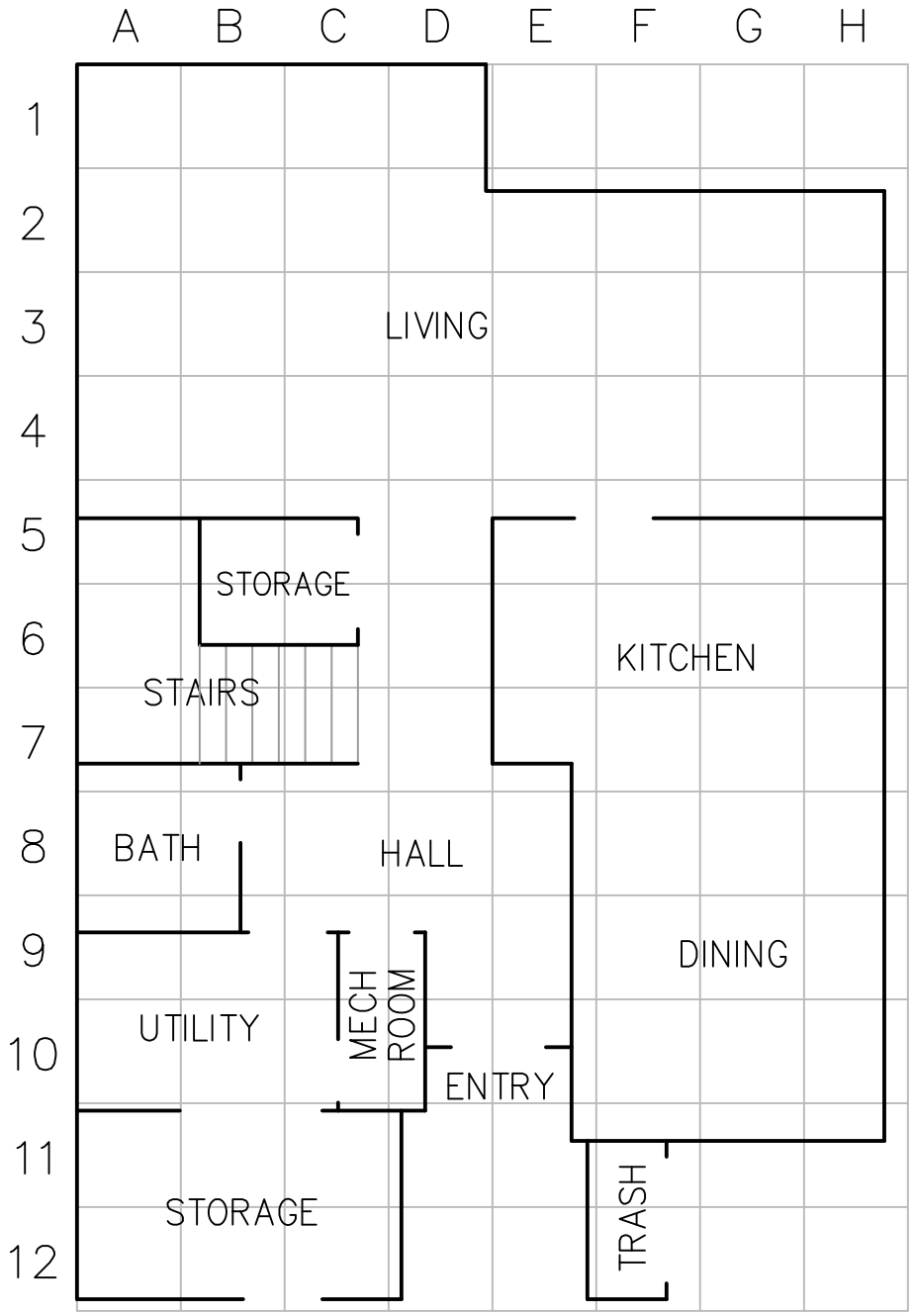

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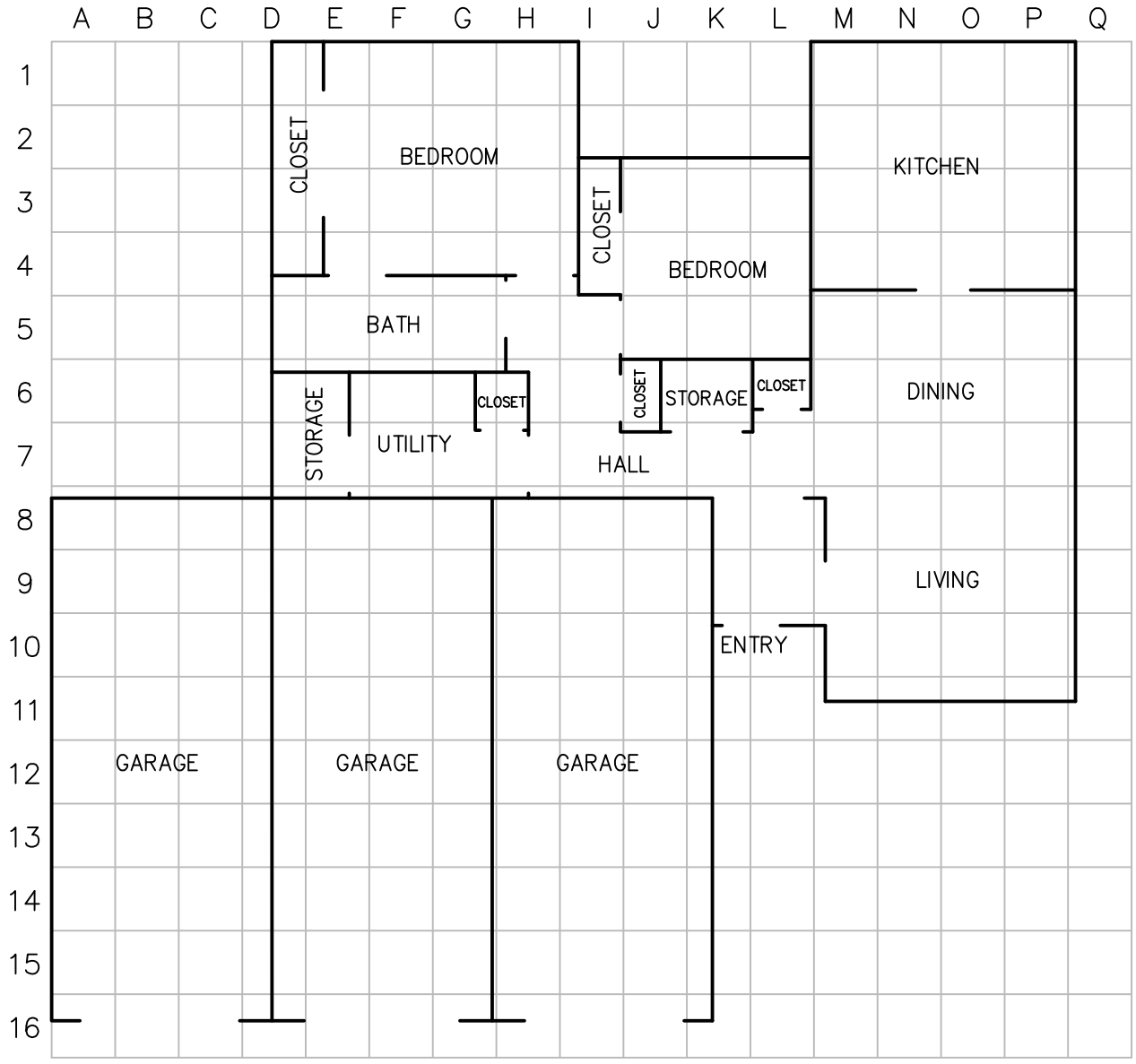
FIGURE 17
UNIT LAYOUT
1300 SERIES
4-BEDROOM
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1



U.S. DEPARTMENT OF THE NAVY
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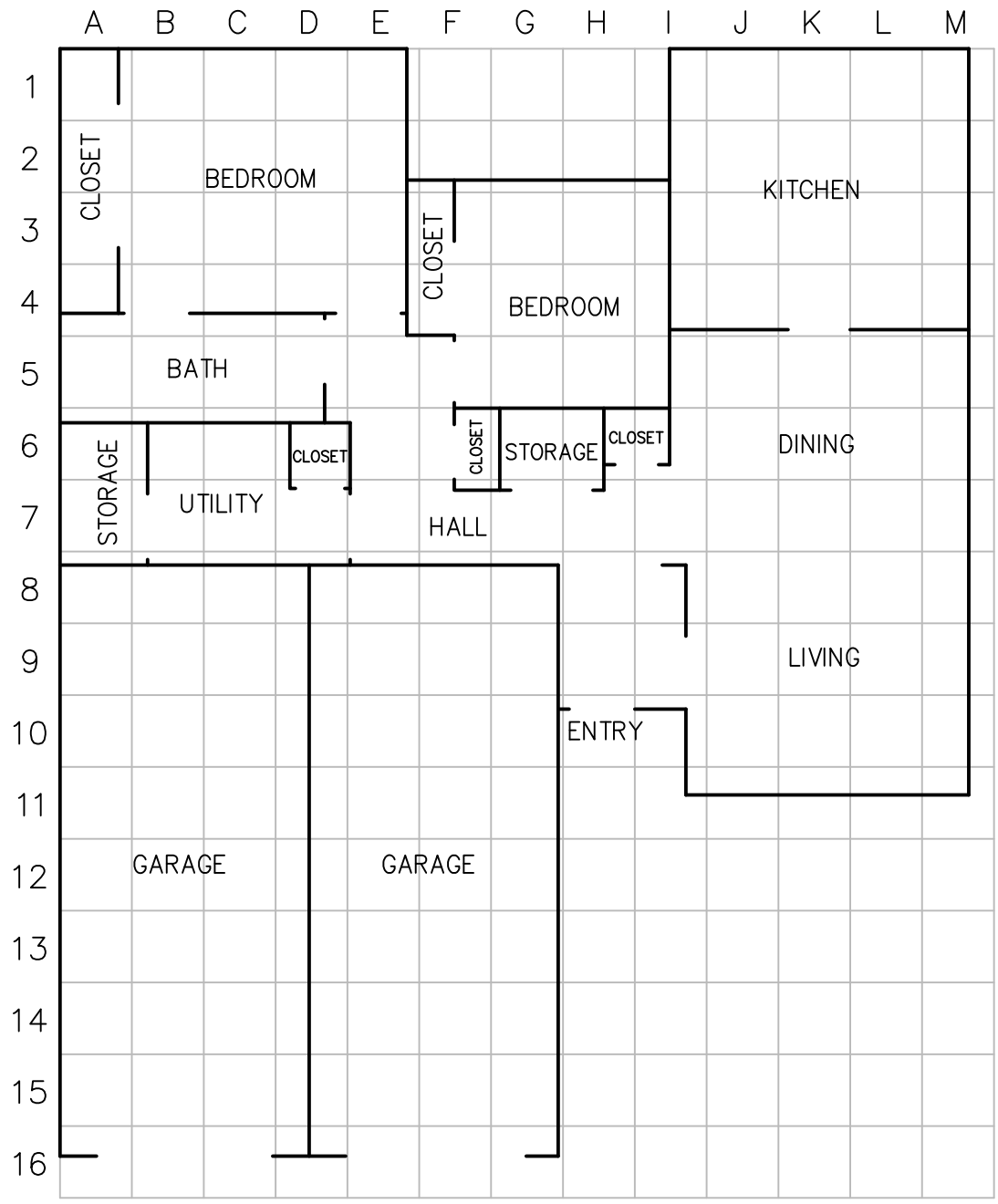
SAN DIEGO, CALIFORNIA

FIGURE 18
UNIT LAYOUT
1400 SERIES
2-BEDROOM, 3-CAR GARAGE
NAVAL STATION TREASURE ISLAND

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY	APPROVED BY	DRAWING NUMBER
-	-	Concord	K. BLACK	6/6/14			500191-A1



U.S. DEPARTMENT OF THE NAVY
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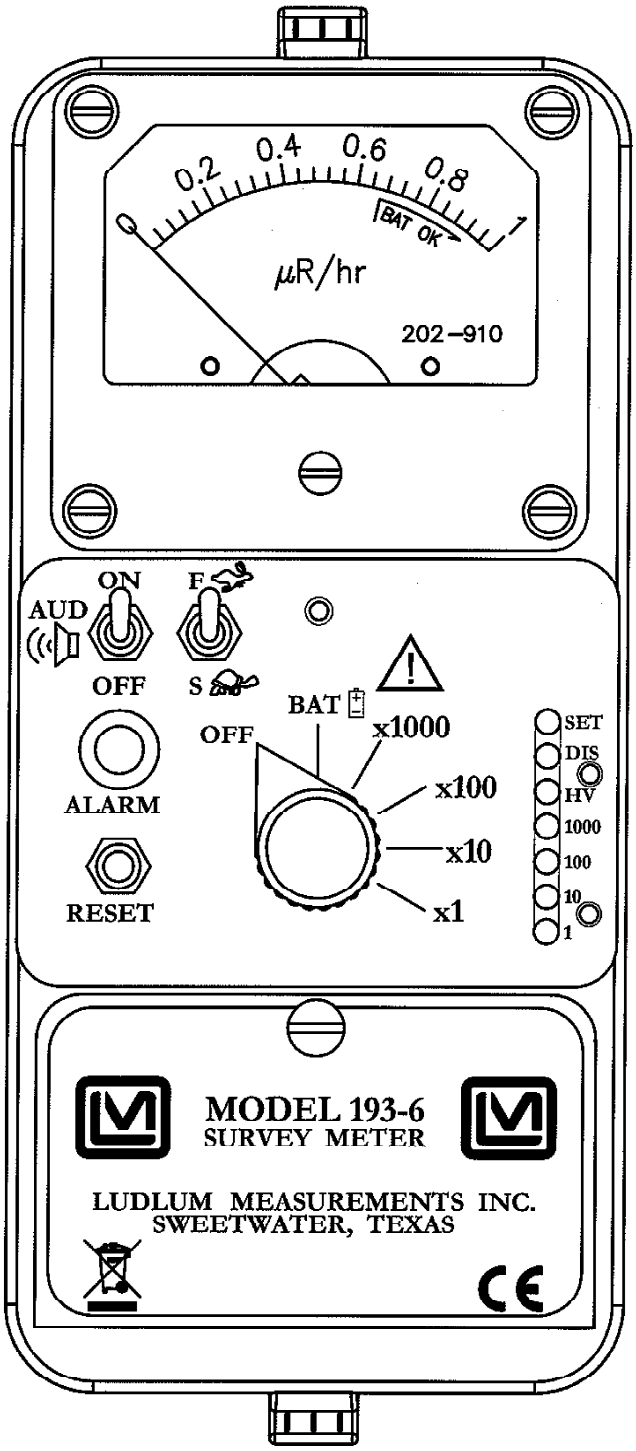
SAN DIEGO, CALIFORNIA

FIGURE 19
UNIT LAYOUT
1400 SERIES
2-BEDROOM, 2-CAR GARAGE
NAVAL STATION TREASURE ISLAND



U.S. DEPARTMENT OF THE NAVY
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FIGURE 20
MODEL 193-6 FRONT PANEL LAYOUT

NAVAL STATION TREASURE ISLAND

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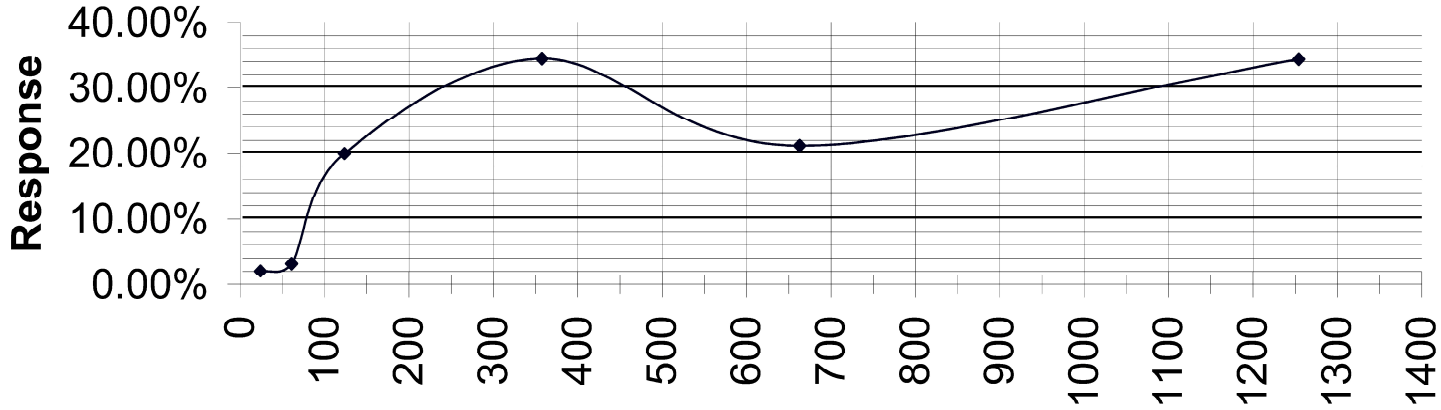

Isotope	Primary Energy in KeV	Source Efficiency 2p	Photon Efficiency
Cd109	22	1.78%	6.11
Am241	59	2.92%	0.16
Co57	122	19.75%	7.35
Ba133	356	34.21%	0.75
Cs137	662	20.94%	1.00
Co60	1253	34.12%	17.12

U.S. DEPARTMENT OF THE NAVY
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FIGURE 21
MODEL 193-6
ENERGY RESPONSE CURVE

NAVAL STATION TREASURE ISLAND

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Tables

Table 1
Former Naval Station Treasure Island Site 12 Housing Providers

Housing Provider	Point of Contact	Comment
The Villages at Treasure Island	Dan Stone, Property Manager Charles Wong, Admin. Assistant 1 Avenue of the Palms, Suite 168 San Francisco, California 94130	
Rubicon Villages	Ken Bonner, Property Manager 1 Avenue of the Palms, Suite 106 San Francisco, California 94130	
Catholic Charities	Erick Brown, Program Manager TIHDI Service Space—Ave D @ 9th St	
Community Housing Partnership	Brandon Ceaser, Property Manager 810 Avenue D San Francisco, California 94130	
Swords to Plowshares	Brian Bigon 1433 Halibut Court Unit F	
HealthRight 360	Shaina Zura, Program Director TIHDI Service Space—Ave D @ 9th St	

Table 2
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1100	Halyburton Court	San Francisco, California 94130	Navy Offline
1101	Bigelow Court	San Francisco, California 94130	Navy Offline
1102	Halburton Court	San Francisco, California 94130	Navy Offline
1103	Bigelow Court	San Francisco, California 94130	Navy Offline
1104	Halburton Court	San Francisco, California 94130	Navy Offline
1105	Bigelow Court	San Francisco, California 94130	Navy Offline
1106	Halburton Court	San Francisco, California 94130	Navy Offline
1107	Bigelow Court	San Francisco, California 94130	Navy Offline
1108	Halburton Court	San Francisco, California 94130	The Villages at Treasure Island
1109	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1110	Halburton Court	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1111	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1112	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1113	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1114	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1115	Keppler Court	San Francisco, California 94130	The Villages at Treasure Island
1116	Hutchins Court	San Francisco, California 94130	CHP—Community Partnership
1117	Keppler Court	San Francisco, California 94130	Rubicon Villages
1118	Hutchins Court	San Francisco, California 94130	The Villages at Treasure Island
1119	Lester Court	San Francisco, California 94130	Navy Offline
1120	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1121	Lester Court	San Francisco, California 94130	Navy Offline
1122	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1123	Lester Court	San Francisco, California 94130	Navy Offline
1124	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1125	Lester Court	San Francisco, California 94130	Navy Offline
1126	Reeves Court	San Francisco, California 94130	CHP—Community Partnership
1127	Lester Court	San Francisco, California 94130	Navy Offline
1128	Reeves Court	San Francisco, California 94130	The Villages at Treasure Island
1129	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1131	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1133	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1135	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1137	Mason Court	San Francisco, California 94130	The Villages at Treasure Island
1139	Ozbourn Court	San Francisco, California 94130	Catholic Charities

Table 2 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1141	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1143	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1145	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1147	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1149	Ozbourn Court	San Francisco, California 94130	The Villages at Treasure Island
1201	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1202	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1203	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1204	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1205	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1206	Mariner Drive	San Francisco, California 94130	Catholic Charities
1207	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1208	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1209	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1210	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1211	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1212	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1213	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1420 (Previously 1214)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island
1215	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1430 (Previously 1216)	Gateview Court	San Francisco, California 94130	CHP—Community Partnership
1217	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1440 (Previously 1218)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island
1219	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1220	Bayside Drive	San Francisco, California 94130	Catholic Charities
1221	Mariner Drive	San Francisco, California 94130	The Villages at Treasure Island
1222	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1223	Mariner Drive	San Francisco, California 94130	CHP—Community Partnership
1224	Bayside Drive	San Francisco, California 94130	The Villages at Treasure Island
1225	Northpoint Drive	San Francisco, California 94130	Healthright 360
1226	Bayside Drive	San Francisco, California 94130	CHP—Community Partnership
1227	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1390 (Previously 1228)	Gateview Court	San Francisco, California 94130	The Villages at Treasure Island

Table 2 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1229	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1394 (Previously 1230)	Gateview Court	San Francisco, California 94130	CHP—Community Partnership
1231	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1232	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1233	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1234	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1235	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1236	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island—Navy Offline
1237	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1238	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1239	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1240	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1241	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1242	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1243	Northpoint Drive	San Francisco, California 94130	CHP—Community Partnership
1244	Northpoint Drive	San Francisco, California 94130	Catholic Charities
1245	Northpoint Drive	San Francisco, California 94130	The Villages at Treasure Island
1397 (Previously 1246)	Gateview Court	San Francisco, California 94130	Rubicon Villages
1247	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1395 (Previously 1248)	Gateview Court	San Francisco, California 94130	Rubicon Villages
1249	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1250	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1251	Exposition Drive	San Francisco, California 94130	Catholic Charities
1252	Exposition Drive	San Francisco, California 94130	Rubicon Villages
1253	Exposition Drive	San Francisco, California 94130	The Villages at Treasure Island
1254	13th Street	San Francisco, California 94130	Healthright 360
1301	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
905 (Previously 1302)	Avenue B	San Francisco, California 94130	The Villages at Treasure Island
1303	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
901 (Previously 1304)	Avenue B	San Francisco, California 94130	The Villages at Treasure Island
1305	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1306	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island

Table 2 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1307	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1308	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1309	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1310	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1311	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1312	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1313	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1314	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1315	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1316	Gateview Avenue	San Francisco, California 94130	The Villages at Treasure Island
1317	Gateview Avenue	San Francisco, California 94130	Navy Offline
1318	Gateview Avenue	San Francisco, California 94130	Healthright 360
1319	Westside Drive	San Francisco, California 94130	Navy Offline
1321	Westside Drive	San Francisco, California 94130	Navy Offline
1323	Westside Drive	San Francisco, California 94130	Navy Offline
1325	Westside Drive	San Francisco, California 94130	The Villages at Treasure Island & Navy Offline
1400	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1401	Sturgeon Street	San Francisco, California 94130	CHP—Community Partnership
1402	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1403	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1404	Sturgeon Street	San Francisco, California 94130	The Villages at Treasure Island
1405	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1406	Sturgeon Street	San Francisco, California 94130	Catholic Charities
1408	Sturgeon Street	San Francisco, California 94130	Rubicon Villages
1409	Flounder Court	San Francisco, California 94130	Catholic Charities
1410	Flounder Court	San Francisco, California 94130	Rubicon Villages
1411	Flounder Court	San Francisco, California 94130	CHP—Community Partnership
1412	Flounder Court	San Francisco, California 94130	Rubicon Villages
1413	Flounder Court	San Francisco, California 94130	CHP—Community Partnership
1418	Striped Bass Street	San Francisco, California 94130	The Villages at Treasure Island
1419	Striped Bass Street	San Francisco, California 94130	Catholic Charities
1420	Striped Bass Street	San Francisco, California 94130	The Villages at Treasure Island
1430	Halibut Court	San Francisco, California 94130	The Villages at Treasure Island
1431	Halibut Court	San Francisco, California 94130	The Villages at Treasure Island
1432	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1433	Halibut Court	San Francisco, California 94130	Swords to Plowshares

Table 2 (continued)
Housing Units at Former Naval Station Treasure Island Site 12

Unit No.	Street	Cite, State, Zip	Housing Providers
1434	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1435	Halibut Court	San Francisco, California 94130	Swords to Plowshares
1436	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1437	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1438	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1439	Chinook Court	San Francisco, California 94130	The Villages at Treasure Island
1440	Chinook Court	San Francisco, California 94130	Healthright 360
1441	Chinook Court	San Francisco, California 94130	Swords to Plowshares
1442	Chinook Court	San Francisco, California 94130	Healthright 360
1443	Chinook Court	San Francisco, California 94130	Swords to Plowshares
1444	Croaker Court	San Francisco, California 94130	The Villages at Treasure Island
1445	Chinook Court	San Francisco, California 94130	Healthright 360
1447	Chinook Court	San Francisco, California 94130	Healthright 360
1449	Croaker Court	San Francisco, California 94130	The Villages at Treasure Island

Notes:

Gray cells indicated Navy off line.

Navy *U.S. Department of the Navy*

Table 3
Project Screening Criteria

Radionuclide of Concern	Project Screening Criteria (µR/hr)
^{226}Ra	2 µR/hr above background

Notes:

µR/hr *microroentgen per hour*

^{226}Ra *radium-226*

Table 4
Project Instrumentation

Instrument Model	Description	Range	Uses
Ludlum Model 193-6	Exposure rate meter utilizing a 6-inch by 1-inch plastic scintillator	0–1,000 µR/hr	Scanning housing unit surfaces
Ludlum 44-20 and Model 2221	Scaler/ratemeter coupled with 3-inch by 3-inch NaI crystal	0–999,960 cpm	Scanning building surfaces in ratemeter mode and utilizing the scaler function to perform timed count rates under static conditions
Canberra Inspector 1000	Multi-channel analyzer coupled with a 3-inch by 3-inch NaI crystal	N/A	Radionuclide identification

Notes:

µR/hr	*microroentgen per hour*
cpm	*counts per minute*
N/A	*not applicable*
NaI	*sodium iodide*

Table 5
Summary of Data Quality Objectives

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Statement of Problem	Decisions	Inputs to the Decisions	Boundaries of the Study	Decision Rules	Limits on Decision Errors	Optimize the Sampling Design
No data exists currently to evaluate the potential radiological risk to residents of housing units within IR Site 12 at NSTI. The Navy is performing a radiological scoping survey to obtain radiological data for use in determining additional actions that may be required.	The decision to be made for each housing unit is as follows: "Do scoping survey results indicate that elevated radioactivity in the housing unit may result in an unacceptable exposure to residents?"	Radiological surveys will include: • Scan and stationary exposure rate measurements collected with the Ludlum Model 193-6 • Additional survey measurements to further delineate and characterize anomalous Ludlum Mode193-6 measurements • Location data within the housing unit • Observational data about survey obstructions, construction materials, general use of each room, other housing unit conditions	The boundaries of the study consist of radiological surveys of the ground floor of each housing unit. Only interiors (including unattached storage sheds and garages) will be surveyed. All housing units currently available for lease are included in the study.	If the results of the survey in a housing unit are below 2 µR/hr above background, radiation levels do not indicate that there is an unacceptable exposure to residents. If the results of the survey in a housing unit exceed 2 µR/hr above background, further investigation will be conducted.	Decision errors will be minimized to the extent possible. No specific decision error values are set for this study.	Measurements that exceed project screening levels will be identified in real-time and investigated further. Survey data collection devices will be programmed to recognize anomalous data entries and will require the user to correct the error before continuing the survey.

Notes:

µR/hr	*microroentgen per hour*
IR	*Installation Restoration*
Navy	*U.S. Department of the Navy*
NSTI	*former Naval Station Treasure Island*

Table 6
Contact Information

Name	Title/Role	Organization	Telephone Number	Email Address or Mailing Address
Dave Clark	Contracting Officer Representative	NAVFAC SW BRAC PMO	619.532.0973	david.j.clark2@navy.mil NAVFAC SW BRAC PMO West 1455 Frazee Road., Suite 190 San Diego, California 92108
Christopher Yantos	Contracted Navy Support	NAVFAC SW BRAC PMO	619.532.0912	christopher.yantos.ctr@navy.mil NAVFAC SW BRAC PMO West 1455 Frazee Road., Suite 190 San Diego, California 92108
Keith Forman	Navy BRAC Environmental Coordinator	NAVFAC SW BRAC PMO	619.532.0913	keith.s.forman@navy.mil NAVFAC SW BRAC PMO West 1455 Frazee Road., Suite 190 San Diego, California 92108
Zachary Edwards	Environmental Protection Manager	Radiological Affairs Support Office; Naval Sea System Command Detachment	757.887.7762	zachary.edwards@navy.mil Building 1971 NWS PO Drawer 260 Yorktown, Virginia 23691-0260
Gary Munekawa	Resident Officer in Charge of Construction SF Bay	NAVFAC SW	650.603.9834	gary.munekawa.navy.mil
Patricia McFadden	Caretaker Site Office	NAVFAC SW	415.743.4720	patricia.a.mcfadden@navy.mil
Ulrika Messer	CB&I Project Manager	CB&I	619.446.4529 619.241.9451 (cell)	ulrika.messer@cbifederalservices.com 1230 Columbia Street, Suite 1200 San Diego, California 92101
Raymond Schul	CB&I Radiation Safety Officer	CB&I	415.398.6547 x243	raymond.schul@cbifederalservices.com 950 Avenue M Treasure Island San Francisco, California 94130

Table 6 (continued)
Contact Information

Name	Title/Role	Organization	Telephone Number	Email Address or Mailing Address
John Massey	CB&I Field Crew (Radiological Technicians) Supervisor	CB&I	925.681.9209	john.massey@cbifederalservices.com 950 Avenue M Treasure Island San Francisco, California 94130
John Hackett	CB&I Technical Manager	CB&I	720.554.8232	john.hackett@cbifederalservices.com 9201 E. Dry Creek Rd. Centennial, Colorado 80112
Jim Click	Field Crew (Labor) Supervisor	CB&I	303.345.8998	james.click@cbifederalservices.com 950 Avenue M Treasure Island San Francisco, California 94130
Takeshi Ibuki	CB&I Quality Control Manager	CB&I	415.398.6547 Ext. 232 415.577.7245 (cell)	takeshi.ibuki@cbifederalservices.com 950 Avenue M Treasure Island San Francisco, California 94130
Norm Hanelt	CB&I Site Safety and Health Officer	CB&I	415.398.6547 Ext. 231	norm.hanelt@cbifederalservices.com 950 Avenue M Treasure Island San Francisco, California 94130

Notes:

BRAC	*Base Realignment and Closure*
CB&I	*CB&I Federal Services LLC*
NAVFAC SW	*Naval Facilities Engineering Command Southwest*
PMO	*Project Management Office*
SF	*San Francisco*

Table 7
CB&I Federal Services LLC Notifications

Notification Event	Navy RPM	RASO	ROICC	CSO	CDPH	Residents
Mobilization	✓	✓	✓	✓		✓[a]
License implementation	✓				✓	
Start of scoping surveys	✓	✓	✓	✓		
Instrument static reading above screening level [b]	✓	✓				
Significant event [c]	✓	✓	✓	✓		
Schedule change	✓	✓	✓	✓		
Demobilization	✓	✓	✓	✓		

Notes:

[a] Via pre-approved flyer.

[b] Static survey meter readings will be collected and additional surveys with secondary instruments as applicable.

[c] Including issues gaining access to a unit or obstructions for collecting data.

CDPH	*California Department of Public Health*
CSO	*Former Naval Station Treasure Island Caretaker Site Office*
Navy	*U.S. Department of the Navy*
RPM	*Remedial Project Manager*
RASO	*Radiological Affairs Support Office*
ROICC	*Resident Officer in Charge of Construction (U.S. Department of the Navy)*

Appendix A
Data Management Plan

APPENDIX A

FINAL
DATA MANAGEMENT PLAN
Radiological Scoping Surveys
Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California

Contract Number: N62473-12-D-2005
Contract Task Order: 0005

Document Control Number: CBI-2005-0005-0003

June 2014

Submitted to:

Base Realignment and Closure
Program Management Office West Naval Facilities Engineering Command
1455 Frazee Road, Suite 900
San Diego, California 92108

Submitted by:

CB&I Federal Services LLC
4005 Port Chicago Highway, Suite 200
Concord, California 94520-1120

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Acronyms and Abbreviations

CB&I	CB&I Federal Services LLC
DQA	data quality assessment
ID	identification
QC	quality control

1.0 Introduction

This Data Management Plan describes the systems and procedures to be used to support and facilitate the execution of the radiological scoping surveys at Installation Restoration Site 12 housing units at former Naval Station Treasure Island. The plan identifies and addresses production-related and technical data collection, management, and reporting needs associated with conducting multiple radiological surveys in multiple locations by multiple teams under an expedited schedule. The key success factors in a good data management approach are consistency, achieved through standardization of data and execution, and a thorough understanding of the technical process, objectives, data, and its intended uses. This data management approach demonstrates a solid focus on those factors. The plan discusses and defines the data management elements as follows:

- Data needs and objectives as defined and executed by the process
- Standard nomenclature or naming conventions
- Survey data verification
- Mobile data collection and near real-time data availability
- Technology platform
- Reporting needs and objectives
- Data turnover and final archival

The quality of the data collection process will be assessed through on-going reviews of all documentation and measurements performed and verification that information recorded is accurate and complete.

2.0 Data Needs and Objectives—Process Data Flow

Radiological surveys of the identified housing units will be conducted by approximately six crews on a daily basis. The objectives of the data management process to support these activities are two-fold:

- Accurately capture and manage necessary technical data, based on the identified data quality objectives, and relative attribute or metadata to support and defend a thorough analysis of the results on a near real-time basis
- Capture and manage production rates and status of work assignments

Figure 1 presents the data process flow to be executed and to which the data management process and supporting application has been built.

2.1 Reference Data—Database Initiation

In order to facilitate the data collection process and minimize data entry, the following data have been captured and used to initiate the database as reference or static information:

- Unit identification (ID) (address)—to be used to track work and uniquely identify each survey performed
- Floor plan images and grid overlays—to guide a thorough and standardized execution of the survey measurement approach amongst field teams
- Unique grid cell IDs—nomenclature "Building" "Unit"-"Grid" (e.g., 1101A-A2, tied to specific location within each unit)
- Room type will be captured and referenced for each cell or grid ID to provide "use" information where needed for data analysis
- Instrument Data:
  - Instrument type
  - Serial number by instrument type
  - Calibration data by serial number
  - Unit of measure by instrument type
- Project screening criteria—to be used for comparison purposes during the course of the survey immediately identifying potential anomalies

2.2 The Field Data Collection Process—Conducting the Survey

As the surveys are executed, the reference data, as described in Section 2.1, are used to prompt, identify and facilitate the new survey performed using the mobile data collection device (Dell® tablet or equivalent). Entry screens walk the survey technician through the process of collecting exposure rate readings for each grid. To initiate the survey, the user selects the housing unit layout to be surveyed, prompting a pre-defined list of grid IDs (based on floor plan). Exposure rate measurements are entered as completed for each grid ID. The grid cell is marked complete by the application when one of the four following conditions is met:

- Reading is entered—and by comparison below the designated screening level.
- Reading is not possible—due to site conditions and those conditions are entered as well as a photo of the condition captured.
- Reading is entered and exceeds the designated screening level prompting a secondary measurement for further analysis and information.
- Reading is entered and exceeds the designated screening level prompting the verification of results, but the reading is not confirmed and requires additional follow up. Note that the system would allow the survey to proceed conditionally for production purposes but would be tagged for tracking the necessary follow up for final closure.

All readings are compared to the project screening criteria. When the reading exceeds the screening level (anomaly), the user is prompted to provide the following:

- A description of the surveyed area (required)
- Secondary measurement using alternate radiological survey instrumentation (required)
- Photo of area (optional)

The data entry form requires a second reading entry with associated instrument information (type, serial number, unit of measure). The technician is required to perform the secondary measurement using one of the following methods:

- Static Reading—On contact, Center
- Static Reading—12-inch height, Center
- Static Reading—36-inch height, Center
- Static Reading—4-inch height, Bullseye
- 3 × 3—4-inch height, Bullseye, 6-second count

- Inspector 1000 Spectrum

The technician has the ability to perform any or all of the methods given the technical nature of the anomaly and the data required to confirm the reported exposure rate measurement.

2.3 Data Verification

The process includes a series of data verification or quality check points both built into the application as well as prompting manual reviews and acceptance.

Completeness, on a unit level, is tracked by the technician visually using color change. As the grid cell meets one of the conditions defined above, its color is changed by the application to provide an indication of progress and spatial orientation throughout the survey using a display of the unit's floor plan and grid overlay. A second verification of status or measure of completion is managed using data selection. The grid ID will drop from the valid, selection list when one of the four conditions above is met. The ID is no longer available for selection. The user will know all cells have been addressed when there are no grid IDs remaining to select for entry.

Readings requiring additional follow up are reported and tracked within the system until resolved. That resolution acknowledgement is required to move the status of the housing unit survey to complete. Until that time, the unit survey is available for "restart" from the main page of the application and is removed when the necessary signoffs have been applied.

The meter readings are compared to the associated project screening criteria upon entry so that the technician is immediately aware of the anomaly. As described in Section 2.2, anomalous readings (exceeding screening criteria) prompt the user for additional information and require the user to capture a description of surrounding conditions, photos, as appropriate, and to perform and provide the reading results. Communication of the anomalous readings of concern may also be required. Details of that communication are also entered into the database for closure.

Once all grid IDs are complete, a summary report is available from the tablet to provide the senior technician a comprehensive view of the data collected for review, follow up as needed, and then signoff when the housing unit meets all criteria of completion.

Any modifications to that survey data, once accepted and "signed off" by the responsible party, are tracked and data about the change captured (modification, user, date, and time) for auditing purposes. These modifications must be completed directly within the database by the data manager as approved and directed by the senior technician and/or crew supervisor.

2.4 Additional Data Collection

General radiological data collection and recordkeeping requirements are described in the *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California* (CB&I Federal Services LLC [CB&I], 2014, as updated or revised), State of California Radioactive Materials License 7789-04 procedures, and applicable site-specific work instructions.

Additional radiological survey data collected to supplement the process described in Sections 2.1 and 2.2 may be recorded in the field on prepared field forms, or may be logged on a field computer. Standardized field forms will be used; however, the recording of data temporarily in a field logbook and subsequent transcription to a form is acceptable. Data recorded on field forms will be transcribed into a spreadsheet or database for development of final documentation or customization of data reporting format. Original field survey forms, if used, will be scanned and maintained in an electronic filing system, and the original hard copies will maintained with the project files, per applicable project and license procedures. Review of radiological data collected on survey forms will be conducted initially by the Project Radiological Quality Control (QC) Specialist, and then by a radiological controls supervisor, project Radiation Safety Officer, or project Certified Health Physicist within two workdays of field collection and transcription to an electronic format.

3.0 Technology Platform

All application data will be hosted on a Microsoft SQL Server 2012 database server located within the CB&I secure datacenter. Data access for analysis and reporting will be provided through Microsoft SQL Server Reporting Services. All data connections will be password protected and utilize secure sockets layer protection for encryption. Field data collection will be conducted on Dell Venue 11 Pro® tablet personal computers, or equivalent, running Windows 8.1®. All tablets will be fully updated and secured. The data collection application will be developed using the Microsoft® .NET WPF framework with a SQLite local database for offline data storage of collected data. Data synchronization to the database server will be conducted using the Zumero® sync framework over a secure sockets layer data connection.

4.0 Reporting

The database platform allows for great flexibility in reporting options. The application and consistent, rigorous adherence to the data collection process ensures the integrity and usability of the data provided.

Data are made available for reporting near real-time through daily, or more frequent as required, data synchronizations with the Treasure Island Building Survey database. Planned reporting includes the following:

- Daily progress report—focused on data needed to report and evaluate production rates and other progress indicators
- Single housing unit reports—comprehensive depiction of the results of a single housing unit survey
- Multiple housing unit reports—as needed, based on required groupings, common variables to facilitate data evaluation, analysis, trending, etc.
- Comprehensive data export, or "flat file" that is delimited for import into other software applications or tools required for data presentation and analysis
- Detailed anomaly reports—to ensure all follow up points have been resolved or to assess any commonality in occurrences, etc.

5.0 Data Turnover and Archival

A comprehensive data file containing all data collected during the execution of this project will provided to the Navy in a format conducive to the requirements of the receiving data storage platform.

Radiological data collection and recordkeeping requirements are described in the *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California* (CB&I, 2014, as updated or revised), State of California Radioactive Materials License 7789-04 procedures, and applicable site-specific work instructions.

Radiological survey data may be recorded in the field on prepared field forms, or may be logged on a field computer. Standardized field forms will be used; however, the recording of data temporarily in a field logbook and subsequent transcription to a form is acceptable. Data recorded on field forms will be transcribed into a spreadsheet or database for development of final documentation or customization of data reporting format. Any original field survey forms, if used, will be scanned and maintained in an electronic filing system, and the original hard copies will maintained with the project files, per applicable project and license procedures. Review of radiological data collected on survey forms will be conducted initially by the Project Radiological QC Specialist, and then by a radiological controls supervisor, project Radiation Safety Officer, or project Certified Health Physicist within two workday of field collection and transcription to an electronic format.

Radiological data collected electronically will be downloaded from field computers and reviewed by the Project Radiological QC Specialist to verify clean download (i.e., no file corruption) at a minimum of once per day. Electronic data files will be maintained on project-specific server with limited personnel access to ensure record maintenance security. Unique file names containing at a minimum the date and subject of the survey (such as survey unit location) will be used.

6.0 Data Recording and Transfer

This section details the requirements for data reporting and data package formats.

6.1 Data Deliverables

All relevant raw data and documentation, including (but not limited to) logbooks, data sheets, electronic files, and final reports, will be maintained in accordance with the contract.

The final data base information will be transmitted electronically (only) with the survey completion report.

7.0 Data Quality Assessment

Based on data validation/review, the project Certified Health Physicist will determine if the method quality assurance objectives have been met and will evaluate data usability for project decisions. The project Certified Health Physicist will prepare a data quality assessment (DQA) report. The DQA report will cover the following topics:

- Implementation of data collection according to the task-specific plan (or data representativeness)
- Data usability for project decisions

The DQA report will be included in the survey completion report for the project.

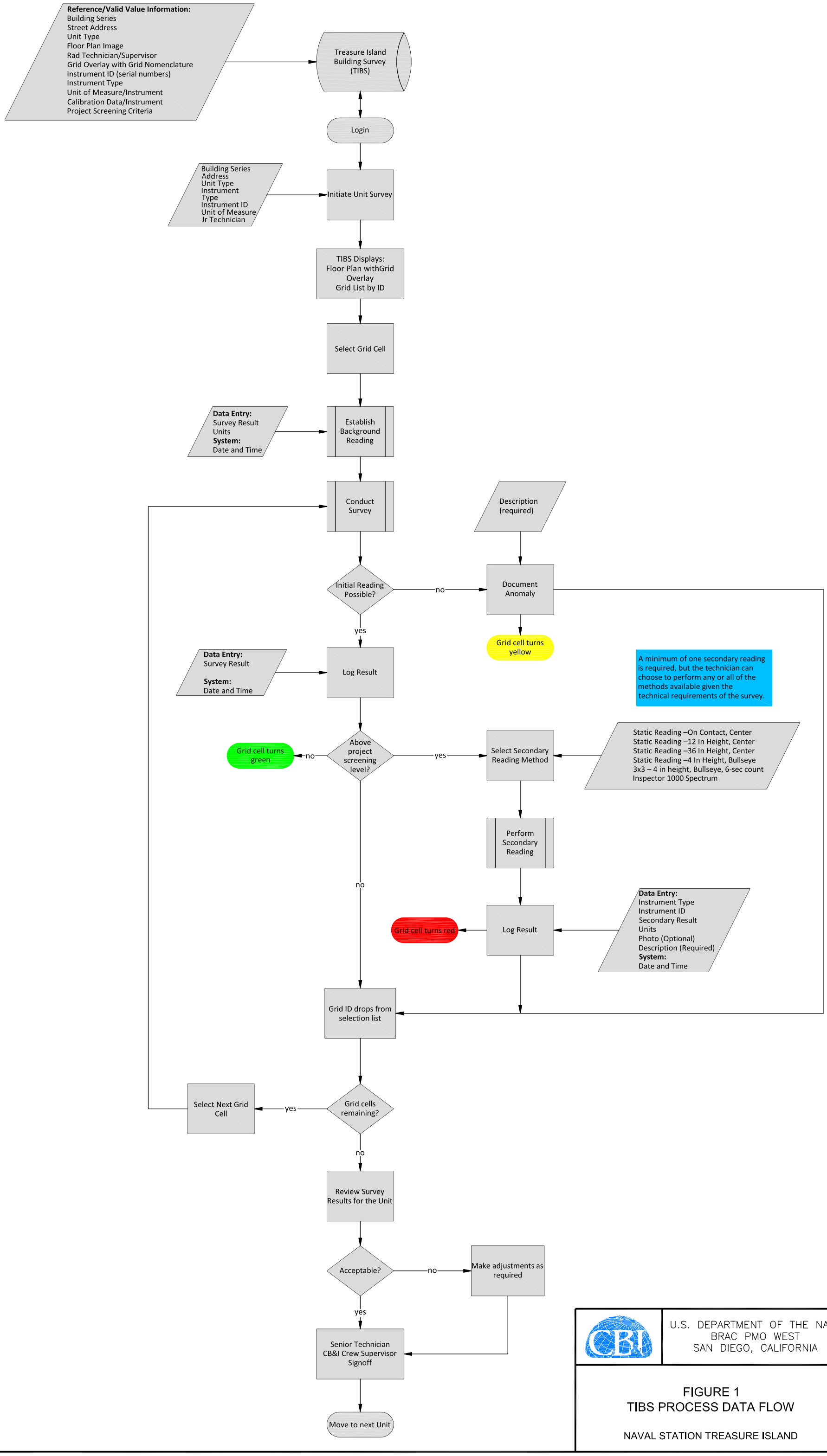
8.0 References

CB&I Federal Services LLC, 2014, *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California,* February.

Figure

IMAGE	X-REF	OFFICE	DRAWN BY	DRAWING NUMBER
---	---	Concord	SCHAEFFER 6-5-14	500191-B1

CHECKED BY	APPROVED BY



U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 1
TIBS PROCESS DATA FLOW

NAVAL STATION TREASURE ISLAND

Appendix B
Contractor Quality Control Plan

APPENDIX B

FINAL
CONTRACTOR QUALITY CONTROL PLAN
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California

Contract Number: N62473-12-D-2005
Contract Task Order: 0005

Document Control Number: CBI-2005-0005-0003

June 2014

Submitted to:

Base Realignment and Closure
Program Management Office West Naval Facilities Engineering Command
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San Diego, California 92108

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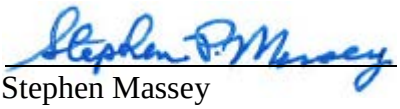
APPENDIX B

FINAL
CONTRACTOR QUALITY CONTROL PLAN
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California

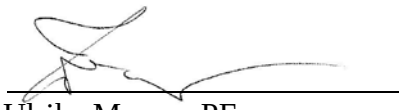
Contract Number: N62473-12-D-2005
Contract Task Order: 0005

Document Control Number: CBI-2005-0005-0003

June 2014

Approved by:  Date: June 6, 2014

Stephen Massey
Program Quality Control Manager

Approved by:  Date: June 6, 2014

Ulrika Messer, PE
Project Manager

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List of Attachments

Acronyms and Abbreviations

APP/SSHP	*Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California*
CB&I	CB&I Federal Services LLC
CMS	*CB&I Management System*
CO	Contracting Officer
COR	Contracting Officer Representative
CQC	contractor quality control
CTO	contract task order
DFOW	definable feature of work
IR	Installation Restoration
Navy	U.S. Department of the Navy
PDT	pacific daylight time
PM	Project Manager
QC	quality control
QCD	quality control directive
TSP	task-specific plan

1.0 Introduction

CB&I Federal Services LLC (CB&I) prepared this Contractor Quality Control (CQC) Plan under Contract No. N62473-12-D-2005, Contract Task Order (CTO) 0005 to describe the quality control (QC) actions that will be implemented during the radiological scoping survey at the Installation Restoration (IR) Site 12 housing units at former Naval Station Treasure Island. This project-specific CQC Plan was developed to ensure project activities are conducted in a planned and controlled manner and conform to contract requirements, and appropriate documentation exists to support each activity for which CB&I is responsible. This CQC Plan will be used in conjunction with the following:

- *Final Construction Quality Management Plan, Contract N62473-12-D-2005, Unrestricted Environmental Multiple Contract Award Contract for Environmental Remediation Services at Various U.S. Department of the Navy, Marine Corps, and U.S. Department of Defense Installations within the NAVFAC Southwest and NAVFAC Atlantic Areas of Responsibility to Include the US Trust Territories of Puerto Rico and Guam* (Shaw Environmental & Infrastructure, Inc., 2012), which includes quality control directives (QCDs)
- *CB&I Management System* (CMS; CB&I, 2014a)

The scope of work for this project includes the preparation of project plans, conducting radiological exposure rate surveys in all leased housing units (and garages and other units where applicable) at IR Site 12, and a conducting a human health risk assessment using the survey data collected. Completing the occupied housing surveys has priority over the unoccupied housing surveys.

The main objective of this project is to collect and present high quality data that is satisfactorily comprehensive to support defensible, real-time decisions to protect human health. The surveys shall be satisfactorily comprehensive to support no further investigation of the housing units if no radiological impacts are found OR support a recommendation that a lease be modified or terminated if radiological exposure exceeds a pre-determined risk threshold. Radiological work will be in accordance with State of California radioactive materials license 7789-07 and associated procedures and work instructions. Radiological safety procedures and roles and responsibilities of the radiological organization are described in the *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California* (CB&I, 2014b, as updated or revised).

A Project QC Manager will be present at the work site to implement and manage the QC Program. The Project QC Manager will work closely with the Project Manager (PM) and

with the U.S. Department of the Navy (Navy) quality assurance representatives to assure that the work is performed in compliance with specifications contained in the approved project plans, including this CQC Plan. The Project QC Manager has the authority to stop work if contract requirements are not being met. In the event that the Project QC Manager is unavailable, an alternate QC Manager will assume this responsibility.

The Program QC Manager for this Navy contract is responsible for developing, maintaining, and enforcing the QC Program for the contract, and will work directly with the PM and the Project QC Manager to assure that all work is performed in compliance with the contract. The Program QC Manager will serve as an alternate contact for the Project QC Manager if questions arise regarding acceptability of materials or performance during the project.

The PM reports to the Program Manager for the contract, who has the responsibility and authority to ensure that the work is performed according to the approved specifications and to the Navy's satisfaction.

Attachment 1 depicts CB&I's project organization for this CTO. Attachments 2 through 9 are documents from the QCDs tailored to this CTO, which will help achieve statement CTO objectives. Attachment 10 provides quality procedures that support this CTO. If additional project-specific quality procedures are required as the project progresses, these procedures will be added to Attachment 10.

2.0 Quality Control Organization

CB&I structured its corporate QC organization to support the Program Managers and PMs who have ultimate responsibility for the quality of services CB&I provides. The Program Managers and PMs are responsible for ensuring that personnel in their organizations understand the corporate and contract-specific QC programs and that their organizations' functions are setup and maintained effectively.

Quality issues are resolved at the lowest possible organizational level at each project site, to enable timely correction action development and implementation. Issues that cannot be satisfactorily resolved at the project level are elevated to and resolved at the corporate level.

CB&I's project organization chart, including QC personnel, is shown in Attachment 1. The project organization chart illustrates the reporting and communication relationships between QC personnel, the CB&I field team, subcontractors, and Navy representatives. This structure provides the organizational freedom for personnel to identify and evaluate quality problems and discrepancies, provide recommended solutions, and ensure that appropriate corrective actions are taken.

The specific responsibilities and qualifications associated with each QC-related position are outlined in Attachment 2. The qualifications and experience of the proposed key appointees for this project are summarized in Attachments 3 and 4.

2.1 Quality Control Personnel and Qualifications

Key QC personnel for CB&I projects are assigned on the basis of appropriate experience and the determination that these individuals meet the contract and CTO-specific requirements. The Project QC Manager and Alternate Project QC Manager are appointed by the Program QC Manager. The following paragraphs identify the QC team for this CTO and highlight their responsibilities. Copies of appointees' resumes, certifications, and letters of designation are included in Attachments 3 and 4.

2.1.1 Project Quality Control Manager

The Project QC Manager, who reports directly to the Program QC Manager, will work closely with the PM, Radiation Safety Officer, Radiation Control Supervisor, and Navy QC representatives to assure that the work is performed in compliance with the specifications contained in the Navy approved task-specific plan (TSP). The Project QC Manager has the authority to stop work if contract requirements are not being met. The Project QC Manager's responsibilities are listed in Attachment 2. In the event the

Project QC Manager is unavailable, an Alternate Project QC Manager will assume this responsibility.

2.1.2 Alternate Project Quality Control Manager

In the event the Project QC Manager is unavailable, an Alternate Project QC Manager will assume the QC responsibilities outlined in Attachment 2 and described in this CQC Plan. The Alternate Project QC Managers designated for this project are identified in Attachment 4.

The project team, including subcontractors, will use procedures in this section to ensure quality and achieve project objectives.

2.2 Quality Control Directives

The following QCDs apply to this CTO, except as noted:

- QCD 1.0, “Project Quality Control Personnel Duties, Qualifications, and Authority”
- QCD 2.0, “Project Quality Control Plans”
- QCD 3.0, “Design Review”
- QCD 4.0, “Coordination and Mutual Understanding Meeting”
- QCD 5.0, “Project Quality Control Meetings”
- QCD 6.0, “Submittals”
- QCD 7.0, “Documentation”
- QCD 8.0, “Quality Control Certifications”
- QCD 9.0, “Three Phases of Control”
- QCD 10.0, “Completion Inspections”
- QCD 11.0, “Testing”
- QCD 12.0, “Corrective Action Requests and Non-compliance”
- QCD 13.0, “Rework”
- QCD 14.0, “Change Control”
- QCD 15.0, “Organization and Personnel Certifications Log”
- QCD 16.0, “Field Startup”
- QCD 17.0, “PM Turnover”
- QCD 18.0, “Training”

- QCD 19.0 “Quality Audits”
- QCD 20.0 “Munitions Response Compliance and Quality Assurance”
- QCD 21.0 “Quality Control for Geophysical Surveys”

2.3 CB&I Federal Services LLC Quality Procedures

The CB&I quality procedures that are part of CMS (CB&I, 2014a) and apply to this CTO are listed below. In addition, the *Final Construction Quality Management Plan, Contract N62473-12-D-2005, Unrestricted Environmental Multiple Contract Award Contract for Environmental Remediation Services at Various U.S. Department of the Navy, Marine Corps, and U.S. Department of Defense Installations within the NAVFAC Southwest and NAVFAC Atlantic Areas of Responsibility to Include the US Trust Territories of Puerto Rico and Guam* (Shaw Environmental & Infrastructure, Inc., 2012), which references legacy Shaw Environmental & Infrastructure, Inc. procedures, continue to apply. Where possible both the current CMS and predecessor procedures are listed here. The QCDs take precedence over these procedures.

- CMS-720-01-PR-00130, “Quality Management Organization” (supersedes EIP-Q-001, “Quality Organization”)
- EIP-Q-002, “Stop Work Notice for Quality Related Issues” (no current CMS equivalent)
- CMS-720-01-PR-00120,“Project Quality Plans” (supersedes EIG-Q-003, “Project Quality Plan”)
- CMS-720-02-PR-00480, “Receiving Inspection” (supersedes EIP-Q-004, “Receipt Inspection”)
- CMS-720-01-PR-00230, “Construction Inspection Program” (supersedes EIP-Q-005, “Inspection”)
- CMS-720-01-PR-00290, “Inspection and Test Plans (ITP)” (supersedes EIP-Q-005, “Inspection” and EIP-Q-016, “Test Control”)
- CMS-720-01-GL-00230, “Guidelines for Quality Surveillance Activities” (supersedes EIP-Q-006, “Surveillance”)
- CMS-720-01-PR-00150, “Identification, Control, and Disposition of Nonconforming Products” (supersedes EIG-Q-007, “Nonconformance Reporting”)
- CMS-720-01-PR-00170, “Corrective and Preventive Action” (supersedes EIG-Q-008, “Corrective Action”)
- CMS-720-01-PR-00220, “Internal Quality Audits” (supersedes EIG-Q-009, “Quality Audits”)

- CMS-720-01-GL-00223 “Qualification and Assessment of Internal Auditors” (supersedes EIP-Q-010, “Auditor and Lead Auditor Qualification Program”)
- EIP-Q-014, “Management Assessment” (no current CMS equivalent)
- EIG-Q-015, “Quality Councils” (no current CMS equivalent)

3.0 Outside Organizations

To manage subcontractors and vendors effectively, CB&I carefully selects and prequalifies each firm. CB&I continuously and aggressively manages subcontractor costs, schedule, safety, and quality performance. The pre-qualification process ensures that subcontractors bring the same focus on quality, cost control, schedule discipline, and commitment to customer satisfaction as CB&I. Once an award is made to a subcontractor, CB&I manages the quality of the subcontractor's performance through the three-phase inspection process outlined in Section 9.0.

Names and qualifications of subcontractors proposed for this project are summarized in Attachment 5. Subcontractors, if applicable, will be subject to CB&I QC procedures. Testing and inspection procedures will be monitored by CB&I as described in Section 5.0.

4.0 Submittal Procedures

Submittals will be managed by CB&I as required by contract. The Project QC Manager will review and approve items prior to submittal. The Project QC Manager will certify that submittals are in compliance with contract requirements. Radiological data will be reviewed by the Project Radiation Safety Officer or designee prior to submittal. Submittals are further discussed in QCD 6.0.

5.0 Testing

In addition to implementing the three phases of control system to ensure the overall quality of each definable feature of work (DFOW), CB&I will make use of formal testing procedures where applicable, including tests performed by subcontractors and/or off-site laboratories, to ensure conformance to applicable specifications and verify that control measures are adequate to provide a finished product which conforms to contract requirements. The Project QC Manager will ensure that testing is managed and performed as required by contract.

5.1 Testing Plan and Log

The Project QC Manager will use the "Testing Plan and Log," contained in Attachment 7, to manage project testing. As tests are performed, the Project QC Manager will record on the log the date the test was performed and the date the test results were forwarded to the Contracting Officer (CO) or Contracting Officer Representative (COR) as applicable. The Project QC Manager will attach a copy of the updated log to the last Daily Contractor QC Report of each month. Chemical sampling and analyses are not required for this CTO.

5.2 Testing and Documentation

CB&I will submit test reports, containing test results to the CO and/or COR as required by contract. Test reports will cite applicable contract requirements, tests or analytical procedures used, and include a statement that the item tested or analyzed conforms or fails to conform to specified requirements. If the item fails to conform, CB&I will notify the CO and/or COR immediately. CB&I will submit the signed test reports, certifications, and other documentation to the CO and/or COR via the Project QC Manager. The Project QC Manager shall submit a summary report of field tests in the Daily Contractor QC Report. Testing is further discussed in QCD 11.0.

6.0 Rework Items, Non-Compliances, and Corrective Action Requests

The Project QC Manager will review any instances where materials, equipment, or activities fail to meet the specified requirements, and will take appropriate action to prevent future occurrences.

6.1 Rework

A rework item is work that does not comply with the contract. There is no requirement to report a rework item that is corrected the same day it is discovered. All CB&I and subcontractor personnel will be responsible for identifying rework items and reporting them to the Project QC Manager. The Project QC Manager will coordinate with the Project Superintendent to ensure rework items are corrected in a timely manner. The Project QC Manager shall maintain a "Rework Items List" of work that does not comply with the contract, including those identified by the CO or his/her representative. The Project QC Manager will report identified and corrected items in the Daily Contractor QC Report and during project QC meetings and will attach a copy of the "Rework Items List" to the last Daily Contractor QC Report of each month. Rework items are further discussed in QCD 13.0.

6.2 Non-Compliances

The CO may also notify CB&I of any detected non-compliance with the contract. CB&I will take immediate corrective action after receipt of such notice. Such notice, when delivered to CB&I at the work site, shall be deemed sufficient for the purpose of notification. Noncompliances are further discussed in QCD 12.0.

6.3 Corrective Action Requests

CB&I will identify, track, and correct items, processes, and services that do not meet established requirements. Correction will focus on determining the cause of the deficiency and corrective actions the deficiency and prevent recurrence. Corrective Action Requests are further discussed in QCD 12.0.

6.4 Procedures for Tracking Laboratory Deficiencies

Laboratory testing is not required under this CTO.

7.0 Documentation

A variety of documents will be developed at specified points or intervals during the course of this project to support the QC process. These items will be submitted to the government or maintained by CB&I and made available for review as required. QC-related project documentation may include:

- Daily CQC reports
- Three-phase control inspection checklists (preparatory, initial, and follow-up)
- QC meeting minutes
- Rework items list
- Noncompliance/corrective action reports
- Building survey data
- Material receipt inspections

Documentation is further discussed in QCD 7.0.

7.1 Daily Reports

CB&I shall submit reports for each day that work is performed as required by contract. Reports will be attached to the Daily Contractor QC Report. The reporting of work shall be identified by terminology consistent with the construction schedule. The "remarks" section of reports will include directions received, construction deficiencies and problems, QC problems, deviations from project plans, conflicts or errors in the drawings or specifications, field changes, instructions given and corrective actions taken, work progress and delays, safety hazards, meetings held, and visitors to the work site.

7.1.1 Daily Contractor Quality Control Report

The Project QC Manager is responsible for preparing and signing the Daily Contractor QC Report. Other QC, production, and health and safety documents may be attached to this report. The Project QC Manager will submit the report by 10:00 a.m. pacific daylight time (PDT) to the Navy the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

7.1.2 Daily Contractor Production Report

The Project Superintendent is responsible for preparing and signing the daily contractor production report. The Project QC Manager will submit the report by 10:00 a.m. PDT to the

Navy the next working day after each day that work is performed and for every seven consecutive calendar days of no-work.

7.1.3 Quality Control Specialist Report

If a QC Specialist is assigned, he/she shall prepare, sign, and date a report for each day that work is performed in his/her area of responsibility. This report shall include the same documentation requirements as are submitted with the Daily Contractor QC Report.

7.2 Quality Control Validation

CB&I shall maintain files of original documents in a home office, including project documents. Copies of project documents will also be filed in the field office. Project files include, but are not limited to, inspection reports and checklists, "Testing Plan and Log," "Rework Items List," and punch lists. Reports are required from the QC Specialists (if assigned) for each day that work is performed in their area of responsibility. QC Specialist reports shall include the same documentation requirements as the Daily Contractor QC Report for their area of responsibility. QC Specialist reports are to be prepared, signed, and dated by the QC Specialists and shall be attached to the Daily Contractor QC Report prepared for the same day.

7.3 As-Built Drawings

Because this CTO does not include a construction element, as-built drawings will not be prepared. Upon completion of work, the Project QC Manager will certify that data collection reporting is accurate and that all deliverables are submitted to the CO per QCD 8.0.

8.0 Definable Features of Work

A DFOW is a representative portion of work that is separate and distinct from any other stage of work. Two DFOWs have been identified for this project, as outlined in the following subsections and further described in the TSP. Activities associated with the project will be conducted in accordance with the TSP; *Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California* (APP/SSHP; CB&I, 2013b) and *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California* (CB&I, 2014b, as updated or revised) for this project, which provide specific methods and requirements for implementation of the DFOWs.

8.1 Definable Feature of Work 1: Radiological Scoping Survey

CB&I shall conduct a radiological scoping survey of the ground floor of the housing units and garages (and other areas as applicable) within IR Site 12. Radiological scoping surveys will be conducted in accordance with a 1-meter by 1-meter grid system. Additional data may be collected should project screening levels be exceeded.

8.2 Definable Feature of Work 2: Fieldwork Reports and Data Analysis

CB&I shall complete daily radiological and field reports throughout the time of the fieldwork performance and submit them electronically to the Navy Remedial Project Manager and the Radiological Affairs Support Office Environmental Protection Manager by 10:00 a.m. PDT the following morning. Survey results that exceed the project screening level shall be reported to the Navy Remedial Project Manager immediately. CB&I shall provide real-time analysis of data collected in the field.

9.0 Three Phases of Control

The Project QC Manager manages the three phases of control to adequately cover on-site and off-site DFOWs. The Project QC Manager may assign the Task Leader for DFOWs to other project personnel, including the Project Engineer, Project Geologist, Project Superintendent, QC Specialist, etc.

9.1 Preparatory Phase

The Project QC Manager shall notify the CO and/or COR, as applicable at least two work days, two weeks for off-site work, in advance of each preparatory phase meeting. The assigned lead shown on the project DFOW Matrix will conduct the meeting. At a minimum the Project QC Manager, QC staff, Project Superintendent, foreman, and Site Safety and Health Officer will attend. When a subcontractor will perform work, that subcontractor's superintendent shall attend.

9.1.1 Preparatory Phase Activities

The following will occur during the preparatory phase:

- Review each paragraph of the applicable specification sections.
- Review the contract drawings.
- Verify that field measurements are as indicated on construction and/or shop drawings before confirming product orders, in order to minimize waste due to excessive materials.
- Verify that appropriate shop drawings and submittals for materials and equipment have been submitted and approved. Verify receipt of approved factory test results, when required.
- Review the “Testing Plan and Log” and ensure that provisions have been made to provide the required QC testing.
- Examine the work area to ensure that the required preliminary work has been completed.
- Coordinate the schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.
- Examine the required materials, equipment, and sample work to ensure that they are on hand and conform to the approved shop drawings and submitted data.

- Discuss construction methods, construction tolerances, workmanship standards, and the approach that will be used to provide quality construction by planning ahead and identifying potential problems.
- Review the APP/SSHP (CB&I, 2013b) and appropriate activity hazard analyses to ensure that applicable safety requirements are met and that required material safety data sheets are submitted.

Results of the preparatory phase will be documented in the "Inspection Report" and attached to the Daily Contractor QC Report.

9.2 Initial Phase

The Project QC Manager shall notify the CO and/or COR at least two work days, two weeks for off-site work, in advance of each initial phase. The assigned lead shown on the project DFOW Matrix will perform the initial phase and he/she will observe the initial segment of the DFOW to ensure that the work complies with contract requirements. Results of the initial phase will be documented in the "Inspection Report" and attached to the Daily Contractor QC Report. Attachments contain this report. The following will be performed:

- Establish the quality of workmanship required
- Resolve conflicts
- Ensure that testing is performed by the approved laboratory
- Check work procedures for compliance with the APP/SSHP (CB&I, 2013b) and the appropriate activity hazard analysis to ensure that applicable safety requirements are met

Results of the initial phase will be documented in the "Inspection Report" and attached to the Daily Contractor QC Report.

9.3 Follow-up Phase

The assigned lead shown on the project DFOW Matrix will perform the follow-up phase for ongoing work daily, or more frequently as necessary, until the completion of the work. Results of the initial phase will be documented in the "Inspection Report" and attached to the Daily Contractor QC Report. Attachments contain this report. The following will be performed:

- Ensure the work is in compliance with contract requirements
- Maintain the quality of workmanship required
- Ensure that testing is performed by the approved laboratory

- Ensure that rework items are being corrected
- Perform safety inspections

9.4 Additional Preparatory and Initial Phases

Additional preparatory and initial phases will be conducted for a deficiency if the quality of ongoing work remains or becomes unacceptable; there are changes in the applicable QC organization; there are changes in the on-site production supervision or work crew; work is resumed after substantial period of inactivity; or other problems develop. The three phases of control are further discussed in QCD 9.0.

10.0 Completion Inspections

This section identifies the types of inspections typically conducted on Navy contracts. CTO 0005 inspections may be fieldwork or data driven at the discretion of the Navy Technical Representative.

10.1 Punch-Out Inspection

The Project QC Manager will manage completion inspections. Near the completion of all work or to verify that statement of objectives or performance work statements are met, the Project QC Manager will ensure work is inspected and a punch list developed. Punch list items include items which do not conform to the approved drawings, specifications and contract, and remaining rework items. The punch list will indicate the estimated correction dates of these items. A copy of the punch list will be provided to the COR, if required by contract. The Project QC Manager will ensure corrected items are verified. Once this is accomplished, he/she will schedule a pre-final inspection.

10.2 Pre-Final Inspection

The Navy will perform a pre-final inspection to verify that fieldwork is complete. A Navy punch list may be developed as a result of this inspection. The Project QC Manager will ensure that the items on this list are corrected prior to notifying the Navy that a final inspection with the client can be scheduled. Any items noted during the preliminary-final inspection must be corrected in a timely manner and be accomplished before the contract completion date for the work.

10.3 Final Acceptance Inspection

If required by contract, the Project QC Manager will notify the CO and/or COR at least 14 calendar days prior to the date a final acceptance inspection can be held, stating that all items previously identified during the pre-final will be corrected and acceptable, along with any other unfinished contract work, by the date of the inspection. The Project QC Manager, Project Superintendent, and others deemed necessary will be present during the inspection with the Navy. If deficiencies remain or are identified during the inspection, the parties will agree on a course of action. Completion inspections are further discussed under QCD 10.0.

10.4 Inspection Documentation

Inspection records will be maintained by the Project QC Manager in accordance with QCD 7.0.

11.0 References

CB&I Federal Services LLC (CB&I) 2013, *Final Accident Prevention Plan, Non-Time Critical Removal Action for Bigelow Court Solid Waste Disposal Area, Installation Restoration Site 12, Former Naval Station Treasure Island, San Francisco, California,* November.

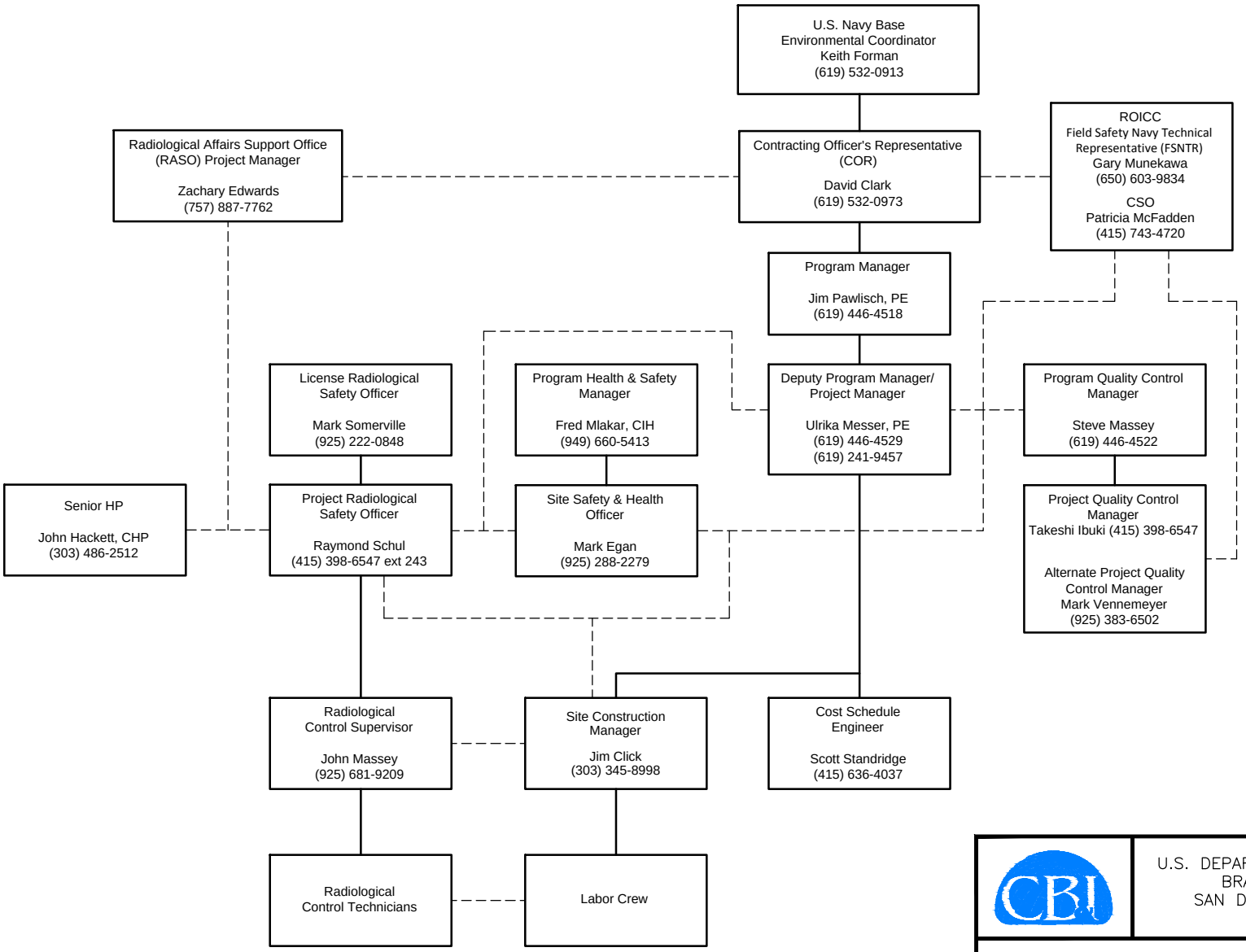
CB&I, 2014a, *CB&I Management System*.

CB&I, 2014b, *Sitewide Radiation Protection Plan, Naval Station Treasure Island, San Francisco, California,* February.

Shaw Environmental & Infrastructure, Inc., 2012, *Final Construction Quality Management Plan, Contract N62473-12-D-2005, Unrestricted Environmental Multiple Contract Award Contract for Environmental Remediation Services at Various U.S. Department of the Navy, Marine Corps, and U.S. Department of Defense Installations within the NAVFAC Southwest and NAVFAC Atlantic Areas of Responsibility to Include the US Trust Territories of Puerto Rico and Guam,* September.

Attachment 1
Quality Control Organization Chart

IMAGE	X-REF	OFFICE	DRAWN BY		CHECKED BY		APPROVED BY		DRAWING NUMBER	500191-A2
---	---	Concord	BLACK	6/5/14						



U.S. DEPARTMENT OF THE NAVY
BRAC PMO WEST
SAN DIEGO, CALIFORNIA

FIGURE 1
ORGANIZATION CHART
CTO 0005
SITE 12 BUILDING SCOPING SURVEYS

NAVAL STATION TREASURE ISLAND

Attachment 2
Project Quality Control Duties and Responsibilities

Project Quality Control Duties and Responsibilities

Duty	Responsibility	QCD
Pre-Construction Phase		
Establish Personnel Requirements	PM	1.0
Review Personnel Resumes	PM	1.0
Assign Duties	PM	1.0, 2.0
Prepare Organization Chart	PQCM	1.0, 2.0
Prepare Letters of Designation	PQCM	1.0, 2.0
Review Plans and Designs	PM, PQCM	3.0, 7.0
Identify Subcontractors	PM	1.0, 2.0
Submit Laboratory Information (NA)	PQCM	1.0, 2.0
Attend Training	all	1.0
Prepare Submittal Register	PQCM	2.0, 6.0
Prepare Definable Features of Work Matrix	PQCM	2.0, 9.0
Prepare Testing Plan and Log	PQCM	2.0, 11.0
Prepare Rework Items List	PQCM	2.0, 13.0
Assemble Forms	PQCM	2.0
Assemble Personnel Certifications	PQCM	8.0, 15.0
Conduct Coordination and Mutual Understanding Meeting	PQCM	4.0
Construction Phase		
Ensure Construction Quality	PM	1.0, 14.0, 16.0, 17.0
Review Definable Features of Work	PQCM	9.0
Ensure Submittals Approved and Submitted	PQCM	3.0, 6.0, 7.0
Conduct Project QC Meetings	PQCM	5.0
Conduct Preparatory Meetings	PQCM	9.0
Conduct Preparatory Inspections	PQCM	9.0
Conduct Initial Inspections	PQCM	9.0
Conduct Follow-Up Inspections	PQCM	9.0
Conduct Completion Inspections	PQCM	10.0
Manage Corrective Action Requests	PQCM	12.0
Manage Rework Items	PQCM	13.0
Provide QC Certifications	PQCM	8.0

Notes:

The PQCM may assign the lead for inspections to the other project personnel: Task Lead, Project Site Superintendent, etc.

NA	*not applicable*
PM	*project manager*
PQCM	*project quality control manager*
QC	*quality control*
QCD	*quality control directive*

Attachment 3
Project Quality Control Manager Letter of Designation, Resume, and Construction Quality Management Training Certificate

Final
Contractor Quality Control Plan
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California
Contract Number N62473-12-D-2005
Contract Task Order 0005

Project Quality Control Manager
Letter of Designation

June 6, 2014

Mr. Takeshi Ibuki:

This letter will serve to assign you as the CB&I Federal Services LLC Project Quality Control (QC) Manager for the above-captioned contract task order. In this capacity, you will report directly to me and will administer the established requirements of the contract and Contractor QC Plan. In the case where you are not able to perform the Project QC Manager's duties, Mr. Lee Laws, Mr. Nigel Sanders, Mr. Mark Seibert, or Mr. Mark Vennemeyer will serve as your Alternate Project QC Manager. You will manage the three phases of control. You are authorized to stop work that is not in accordance with the contract and will exercise this authority consistent with CB&I Federal Services LLC policies and procedures. You are authorized to approve submittals that have been certified by qualified submittal reviewers as identified in the organization chart for this task order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work.

If you have any questions or require additional information, please contact me at 619.446.4552.

Sincerely,

CB&I Federal Services LLC

Stephen Massey
Program QC Manager

Takeshi Ibuki

[redacted]

EXPERIENCE:

CB&I Federal Services, LLC

Radiological Engineer, May 2013 to Present

Remediation projects for Navy's former base at Treasure Island, San Francisco

- Quality Control of all radiological survey data that are submitted by radiological control technicians
- Analyze survey data
- Coordinate and consult radiological work plan, instruct survey documentation methods, provide advices about survey methods and instrumentation to radiological control technicians. Surveillance of activities as part of the three phases of control to ensure that work complies with the project plans
- Prepare radiological survey report for submission to the US Navy and the California Department of Public Health

Shaw Environmental & Infrastructure, Inc.

Radiological Controls Supervisor, May 2012 to February 2013

Remediation projects at Hunters Point Shipyard in San Francisco

- Supervise 14 radiological control technicians on a 27 acre site surveying soil, concrete, sediment, and steel
- Coordinate schedules and plans with other working groups
- Assign tasks, monitor progress and surveillance of work to ensure quality is maintained per the project plans
- Ensure personnel experience and training so that they can satisfactorily perform their duties
- Write daily reports, perform self-assessments, ensure all work is done in accordance with approved work plans and procedures
- Support New York City Rapid Repair Program (Hurricane Sandy Recovery) as an environmental health and safety officer

Shaw Global Services, LLC

Radiological Controls Specialist, July 2011 to December 2012

Support Recovery Projects at Fukushima Daiichi Nuclear Power Plant, Japan

- Installation of Shaw's simplified active water retrieve and recovery system (SARRY)
- Monitor radiation levels on work areas, calculate stay times and track worker exposure to ensure that limits are not exceeded
- Installation of the On-Site Wireless Radiation Monitoring System (SWRM)
- Provide trainings on the SWRM to Tokyo Electric Company Co. personnel and Toshiba engineers
- Maintenance and troubleshooting support for SWRM
- Assisted with business development efforts to forward negotiations

  Work with Ando Corp (a Japanese construction company)
- Provided support for and consulted on the recovery project plan in Minamisoma City, Fukushima Japan

Shaw Environmental & Infrastructure, Inc.

Radiological Controls Supervisor, February 2011 to July 2011

Remediation projects at Hunters Point Shipyard, San Francisco

Primary responsibilities included:

- Supervised field staff for survey, site remediation and decontamination, use of survey equipment and instrumentation, and support of radiation safety program
- Ensured Radiological Control Technician work was done compliance with project plans and other applicable procedures for safety program, survey, and/or remediation actions

- Ensured compliance with NRC, OSHA, and EPA directives, as well as applicable local, state, and federal statutes and codes
- Reviewed radiological field documentation for accuracy, quality, and completeness
- Ensured that each individual working at an impacted area complied with the requirement specified in the RWP
- Supported Fukushima Projects, Tokyo Japan (April to May 2011)

Aerotek Environmental & Engineering

Senior Radiological Controls Technician, September 2010 to February 2011
Remediation projects at Hunters Point Shipyard, San Francisco
Primary responsibilities included:

- Supervised and surveillance of radiological work performed by junior work crews
- Performed radiation and contamination surveys and performed air sampling and analysis
- Radiological survey
- Instrument checks
- Responded to radiological emergencies and conducted incident investigations

Kansai Electric Power Co., Takahama Nuclear Power Plant

Radioactive Waste Management, Supervisor, April 1995 to December 1999

- Prepared radiation level reports for submission to government.
- Supervised characterization disposal and transportation of radioactive waste.
- Performed hazard evaluations, recommended appropriate controls and monitoring procedures.
- Conducted audits of work areas and facilities. Performed ALARA reviews and recommended corrective actions as necessary.
- Created and implemented radiation and contamination control practices and maintenance of the work environment.

Environmental Radiation Safety Technician, Supervisor, April 1988 to April 1995

- Created policies and enforced standards for radiation safety in the work environment.
- Reviewed radiation safety reports submitted from subcontractors.
- Created permissible level of radiation exposure chart to be used during maintenance periods.
- Decontaminated equipment, environment and people.
- Supervised hazardous waste disposal and handling.
- Member of response team for radiological emergencies.

Radiation Safety Technician, April 1985 to April 1988

- Performed radiation and contamination surveys, inventories, leak tests and audits of work areas.
- Provided trained on the use of radiation measurement equipment and tools.
- Maintained safe work environments.
- Performed analysis of the effects of radiation on organs and tissues.

Plant Operator, September 1984 to April 1985

- Trained in Nuclear Power Plant operations.
- Checked data and monitored daily operations.
- Decontaminated and performed maintenance on nuclear systems and machinery.

EDUCATION:

University of California, Berkeley, B.S. in Mechanical Engineering, [redacted]

CERTIFICATIONS AND TRAINING:

- ***US Army Corps of Engineers***, San Diego CA 2014. Construction Quality Management for Contractors.
- ***Japan Radioisotope Association***, Tokyo, Japan 1997: Complete System Maintenance Course, From Supply to Disposal of Radioisotope Products
- ***Certified in Class 1 Radiological Control***, Japan 1994: Passed national certification exam.

- ***National Institute of Radiological Science***, Chiba, Japan 1992: Human-Radiation Interface course and Radiation Protection and Safety course
- Fundamentals of Engineering (FE/EIT)
- 40 Hour HAZWOPER and 8-hr refreshers (current)
- OSHA 30-Hour Construction, 2013
- Japan Class 1 Radiological Control/Handing National Certificate (passing rate 20%)
- Japan Class 1 Work Environment Safety Control and Measurement

OTHER INFORMATION:

- Japanese Citizen, bilingual in English and Japanese, both spoken and written
- Authorized to work in the U.S. (Green Card holder)
- ***Immigrated to the U.S.***, [redacted]
- ***English Classes***, October 2001 to December 2002
- ***Nippon European Motors***, Car Repair Technician, January 2003 to December 2003
- ***College of Alameda***, Formal English Course Work, [redacted]
- ***Physics Tutor at College of Alameda***, September 2005 to December 2007

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

Takeshi Ibuki

SW9-02-14-00223

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

San Diego, CA	5/15/14 - 5/16/14	SW9 - NAVFAC Southwest	Michael Haliburton PMP, PE
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager

Kugan Panchadsaram	kugan@kugan.com	858-212-2941	
Facilitator/Instructor	Email	Telephone	Facilitator/Instructor Signature

Jeffrey D. Dziadzic
Chief, USACE Learning Center

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Compliance Solutions

"Today's Training... Tomorrow's Solution"

3980 Quebec St, 2nd Floor Denver, CO 80207-1633 800-711-2706

Student Affiliation:
Aerotek
99071924

Certificate of Completion

This is to certify that

Takeshi Ibuki

has been tested and successfully meets the training requirements for

40-Hour HAZWOPER

29 CFR 1910.120(e)

Presented

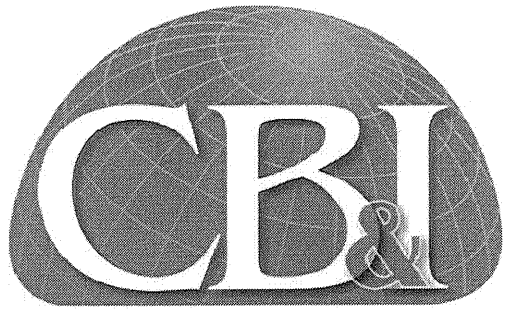
Monday, August 09, 2010

Compliance Solutions Occupational Trainers, Inc.

Certificate Number: 754811781

Neval Gupta
Vice President

Jeffrey Kline
President/CEO



This certificate is awarded to

Takeshi Ibuki

for the successful completion of the course

8-Hour HAZWOPER Refresher

Hours: 8 Hours 0 Min Credits: 0

Completion Date: 8/27/2013

Virgil Barton, Sr. Vice President
Quality, EHS, Regulatory Compliance,
Process Improvement

Certificate of Completion

Presented to:

TAKESHI IBUKI

On 2/20/2013, TAKESHI IBUKI successfully completed the OSHA 30 Hour Outreach Training for the Construction Industry.

OSHA TRAINING INSTITUTE EDUCATION CENTER

USF UNIVERSITY OF SOUTH FLORIDA

American Safety Council .com

OSHA Authorized Trainer

As an OSHA authorized trainer, I verify that I have conducted this OSHA outreach training class in accordance with OSHA Outreach Training Program requirements. I will document this class to my authorizing OSHA training organization. Upon successful review of my documentation, I will provide each student their completion card within 90 days of the end of the class.

Attachment 4
Alternate Project Quality Control Manager Letter of Designation, Resume, and Construction Quality Management Training Certificate

Final
Contractor Quality Control Plan
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California
Contract Number N62473-12-D-2005
Contract Task Order 0005

Alternate Project Quality Control Manager
Letter of Designation

June 6, 2014

Mr. Lee Laws, Mr. Nigel Sanders, Mr. Mark Seibert, Mr. Mark Vennemeyer:

This letter will serve to assign you as CB&I Federal Services LLC Alternate Project Quality Control (QC) Manager for the above-captioned contract task order. In the case where the designated Project QC Manager, Mr. Takeshi Ibuki is unable to perform the Project QC Manager's duties, you will serve in that capacity with his responsibilities and authorities, report directly to me, and administer the established requirements of the contract and Contractor QC Plan. You will manage the three phases of control. You are authorized to stop work that is not in accordance with the contract and will exercise this authority consistent with CB&I Federal Services LLC policies and procedures. You are granted the authority to approve submittals that have been certified by qualified submittal reviewers as identified in the organization chart for this task order and as necessary to ensure the quality of the work, and direct the removal and/or replacement of nonconforming materials or work. You are authorized to act as an alternate for two weeks at one time and not more than 30 workdays during a calendar year. In the case where it is believed that these time periods will be exceeded, you must notify me.

If you have any questions or require additional information, please contact me at 619.446.4552.

Sincerely,

CB&I Federal Services LLC

Stephen Massey
Program QC Manager

Lee H. Laws

Professional Qualifications

Mr. Laws has more than 16 years of QA/QC experience with IT Corporation and The Shaw Group (May 2002 - Present), functioning since 1996, as Project QC Manager on the Navy EFA West Remedial Action Contract (RAC). This project experience has encompassed all phases of CERCLA Removal and Remedial Action cleanups, Superfund and National Priority List (NPL) sites, and numerous petroleum cleanups (e.g., USTs, ASTs) at federal facilities, industrial and residential properties under contracts from the U.S. Navy, U.S. Army Corps of Engineers (USACE), and U.S. Department of Energy (DOE).

Since 1999, Mr. Laws has served as the Lead QC Manager at Naval Station Treasure Island/Yerba Buena Island, which is a top priority Base Realignment and Closure (BRAC) base on the $250M Navy EFA West RAC. During this time period, the project backlog has grown to 16 environmental cleanup Contract Task Orders (CTO's 006, 012, 016, 036, 039, 040, 043, 045, 046, 089, 099, 102, 105, 106, 131, 134) with a total budget of over $37M, including a current backlog of over $20M. Treasure Island CERCLA, RCRA and petroleum cleanup projects have been executed with a high degree of involvement and oversight from the Navy, City of San Francisco, State and County regulatory agencies and local citizen groups who occupy the impacted property.

In support of this growing basewide cleanup program, Mr. Laws has prepared all CTO QC plans, provided ongoing project team and subcontractor coordination of task-specific QC inspections (including interface with two Government QA Resident Officers in Charge of Construction), and maintained all project QC documentation in a cost-effective MS-Access database. Mr. Laws produces project deliverables, including QC records and technical reports, in Adobe (pdf) format on CD-ROM, which substantially reduces project cost. Navy EFA West RAC six-month performance evaluations have consistently rated the Treasure Island QC Program "Level 1 - Outstanding," which has translated into an additional $1,664,316 of award fee profit (to-date) to IT Corporation and The Shaw Group

Education

High School Diploma, General Education, Pittsburg High Schol, Pittsburg, California, [redacted]

Additional Training/Continuing Education

USACE CQM Training, Sacramento, 2004
DHS Lead Supervisor/Monitor, UC Berkeley, [redacted]

Registrations/Certifications/Licenses

USACE Construction Quality Control Manager, 2004, Active, Nationwide, 11/2008

Experience and Background

05/2002 - Present
Project QC Manager, Shaw Environmental & Infrastructure, Inc., Quality, Concord, California

2002 - Present IT Corporation/Shaw Environmental & Infrastructure, Concord, California. Project QC Manager on the Navy Engineering Field Activity (EFA) West, Remedial Action Contract (RAC)

Naval Station Treasure Island, San Francisco, California.

Currently serve as the Lead QC Manager. Responsible for the planning, development and project team implementation of Project QC Plans and documentation on 10 environmental cleanup contract task orders with a total budget of over $37M. Projects involve the design, construction, operation, optimization and maintenance of remediation action systems (e.g., Soil Vapor Extraction); soil sampling, analysis, excavation, treatment, transportation and disposal; and site restoration in sensitive public housing areas. Mr. Laws effectively plans, coordinates and verifies task-specific QC inspections with Task Leaders, the Site Health & Safety Officer, Navy Resident Officers in Charge of Construction (ROICCs) and subcontractors. Mr. Laws also performs independent quality assurance audits, surveillances, and inspections of laboratories and field project activities to verify compliance with established QA program requirements

10/1996 - 05/2002
Project QC Manager, IT Corporation, Martinez, California

1996 - 2002 IT Corporation/Shaw Environmental & Infrastructure, Concord, California. Project QC Manager on the Navy Engineering Field Activity (EFA) West, Remedial Action Contract (RAC)

Naval Station Treasure Island, San Francisco, California.

Currently serve as the Lead QC Manager. Responsible for the planning, development and project team implementation of Project QC Plans and documentation on 10 environmental cleanup contract task orders with a total budget of over $37M. Projects involve the design, construction, operation, optimization and maintenance of remediation action systems (e.g., Soil Vapor Extraction); soil sampling, analysis, excavation, treatment, transportation and disposal; and site restoration in sensitive public housing areas. Mr. Laws effectively plans, coordinates and verifies task-specific QC inspections with Task Leaders, the Site Health & Safety Officer, Navy Resident Officers in Charge of Construction (ROICCs) and subcontractors. Mr. Laws also performs independent quality assurance audits, surveillances, and inspections of laboratories and field project activities to verify compliance with established QA program requirements.

China Lake Naval Air Weapons Station, Ridgecrest, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work plans and the quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan, specifications and requirements based on the program contract. Responsibilities also included performing reviews of documentation and the preparation of daily CQC reports that were submitted to the Navy on the next business morning.

Naval Communication Station, Stockton, California.
Served as the Site Health and Safety Officer. Responsible for providing independent surveillance of the routine implementation of the site safety and health plan. Conducted daily Tailgate Safety Meetings, verified personnel had necessary training and medical clearance to enter work area, performed daily equipment calibrations, monitored personnel for compliance with site safety and health plans, and performed monthly safety inspections.

Yerba Buena Island Housing, Yerba Buena, California.
Served as the Project QC Manager for Lead Base Paint Abatement. Responsible for the implementation of the site specific work plans and the quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports, which were submitted to the Navy on the next business morning.

Alameda Naval air Station, Alameda, California.
Served as the Project QC Manager and Site Superintendent. Responsibilities included implementation of the site specific work and quality control plans. Also responsible for daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Also performed reviews of documentation and prepared daily CQC reports, which were submitted to the Navy on the next business morning. My responsibilities as Site Superintendent included daily production, scheduling activities, ordering equipment and site safety.

Department of Defense Housing, Novato, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work and quality control plans, as well as daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports that were submitted to the Navy on the next business morning.

Naval Medical Center, Oakland, California.
Served as the Project QC Manager. Responsible for the implementation of the site specific work and quality control plans in addition to daily field inspections to ensure that all work was performed in accordance with the work plan specifications and requirements, which were based on the program contract. Responsibilities included performing reviews of documentation and the preparation of daily CQC reports which were submitted to the Navy on the next business

08/1995 - 10/1996
Quality Control Coordinator, IT Corporation, San Jose, California

1995 - 1996 IT Corporation, San Jose, California
Quality Control Coordinator, Engineers Services
Responsible for field QC activities, ensuring that fieldwork was being performed in accordance with the requirements written in the project work plans and procedures. Specific project experience and responsibilities included:

Hamilton Army Air Field, Novato, California.
Served as a Quality Control Inspector for the QC group. Responsible for daily field inspections and the preparation of daily QC reports. Performed reviews of documentation and other duties designated by the Program QC Manager.

07/1993 - 08/1995
Field Analytical Specialist II, IT Corporation, Field Analytical Services, Martines, California

1993 - 1995 IT Corporation, Martinez, California
Field Analytical Specialist II, Field Analytical and Sampling (FAS)
Responsible for organizing and participating in field analytical and sampling activities. Ensured sample protocols were followed, and coordinated between field and laboratory to meet project needs. Specific project experience and responsibilities included the following:

IBM, San Jose, California.
Served as a "lead man" for a demolition crew of three to six employees. Responsible for guidance and inspection of crew?s work. Insured health and safety around work area.

MCAGCC, Twenty Nine Palms, California.
Served as the sample coordinator working with the Jacobs Engineers Group Navy/Clean program at this DOE Superfund site. Acted as Liaison between the field and the laboratory: ordering glassware, coordinating sampling, documenting sampling, and maintaining the field database.

03/1989 - 07/1993
Assistant Field Analytical Specialist, IT Corporation, Martinez, California

1989 - 1993 IT Corporation, Martinez, California
Assistant Field Analytical Specialist, Field Analytical and Sampling (FAS)
Responsible for environmental monitoring on various RI/FS projects in the Western United States. Primary responsibilities were groundwater compliance, soil organic vapor sampling, and soil sampling. Some specific experience include the following:

Mather Air Force Base, Rancho Cordova, California.
Served as a sample team leader in the areas of SOV, soil, and groundwater sample collection. Trained new employees in proper sampling and documentation procedures. Responsible for providing instruction and performing tasks in the areas of monitoring well development, dedicated pump and packer installation, and proper operation of such equipment. Gained experience with sample collection around drill rigs and a clearance for work on military flight lines. Acted as liaison between the field and analytical laboratory. Fulfilled the Sample Coordinator's position in his absence.

Castle Air Force Base, Merced, California.
Served as Assistant Sample Coordina¬tor during this major RI/FS project. Acted as liaison between the field operations and the office. Helped supervise the groundwater sampling and pump installation phases of the project.

U.S. ARMY CORPS OF ENGINEERS

PROFESSIONAL DEVELOPMENT SUPPORT CENTER
HUNTSVILLE, ALABAMA

CERTIFICATE

This is to certify that

LEE LAWS

has completed the Corps of Engineers Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

Given at **Sacramento, CA** (Location) By **Sacramento** (Instructional District) **15 & 16 JUL 2009** (Date)

Robert F. Sutin
Facilitator

Expires: July 16, 2014
Verification (916) 557-7708
THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Gary L. Anderson
Chief, USACE Professional Development Support Center

Nigel Sanders

Professional Qualifications
Mr. Sanders is a graduate of the Civil Engineering program at CSU, Chico. In addition to a range of mathematical, analytical, and laboratory skills, he's had experience with a variety of computer applications and field assignments.

Education
Bachelor of Science, Civil Engineering, California State University, Chico, Chico, California, [redacted]

Additional Training/Continuing Education
OSHA 30 Hour Construction Safety, Findlay, OH , 2010
Hazard Assessment and Resolution Program, Findlay, OH , 2010
8-Hour HAZWOPER Supervisor Training, Findlay, OH , 2010
Unexploded Ordnance Safety Training Program, Dugway Proving Grounds, UT, 2010
In Situ Remediation Technologies for Contaminated Soils, redvector.com, 2010
Petroleum Engineering: Liquid Process Piping - Introduction and Design Strategy, redvector.com, 2010
Defensive Driving (Smith System), Shaw E & I, 2008

Registrations/Certifications/Licenses
Quality Manager, 2009, Active, Nationwide, 11/2014
Engineer in Training, 2008, 130018, Active, California
Site Safety Officer, 2010, Active, Nationwide

Experience and Background

09/2008 - Present
Engineer 2, Shaw Environmental & Infrastructure, Inc., Federal, Concord, California

Responsibilities include collection and interpretation of engineering data, development of project designs, development of technical specifications, and detailed engineering analysis. Produced work plans, design drawings, engineering analyses, and organized associated appendices. Resolved client issues directly. Project Quality Control Manager. Field health and safety oversight.

The following is a summary of key projects:
Engineer 2, Edwards Air Force Base - Site 442, 136450, U.S. Department of the Air Force, Edwards AFB, CA, 09/2009 - Present
Burial trenches located at Site 442 potentially contain chemical warfare agents. Project calls for reducing surface water infiltration by installing soil caps, stormwater diversion berms, and subsurface fencing to prevent intrusion by animal vectors.

Accomplishments:
Change Order - Provided engineering analysis of soil volumes to obtain additional funding for soil capping in contract

Design - Designed soil caps to reduce surface water infiltration and promote drainage, interlinked pre-cast concrete barrier segments, and subsurface fencing to prevent animal intrusion into site. Produced the design drawings. Worked with project manager and client to produce the work schedule.

Workplan - Authored the Remedial Action Work Plan and figures which describe the technical merits and order of operations for the work. Authored the Land Use Control Plan, the write-up for the Infiltration Analysis, and associated figures. Directed authors and reviewers to complete organization and versioning of the work plan and its appendices through the Shaw SharePoint website. Posted documents and GIS data to client's internet portal for review.

Project Quality Control Management - Provide on-site inspections and oversight of all QC issues to maintain conformance with the work plan. Verify that all QC related problems are resolved by overseeing testing, chairing QC meetings, tracking submittals, identifying re-work items, approving as-builts, managing corrective action requests, etc.

Engineer 2, Chanute AFB - Landfill 4, 134238, U.S. Department of the Air Force, Rantoul, IL, 03/2009 - Present
Landfill capping for burial site containing municipal wastes.

Accomplishments:
Design - Assisted with preliminary design of landfill cap and drainage features. Provided analysis of long term surface water infiltration based on weather patterns and design elements using Hydrologic Evaluation of Landfill Performance (HELP) software.

Work Plan - Authored write-up of HELP analysis detailing methodology applied by the program and discussing the results. Responded to client/regulator comments and made revisions as necessary.

Engineer 2, Penn Mine Leachate Collection, 920386, East Bay Municipal Utility District, Caleveras County, CA, 07/2008 - Present
Leachate pumping and data logging at landfill cap containing mine tailings.

Accomplishments:
Health and Safety - Conduct tailgate safety meetings and oversight during site activities

Operations and Maintenance - Provide oversight and support for monthly leachate drainage. Operate portable generator and submersible pump. Collect field data for leachate level at time of pumping and program & download readings from on-site data loggers. Collection/shipping of leachate samples as necessary.

Analysis - Perform data review and trend analysis/graphing of site conditions(leachate level, rainfall, average rate of increase, etc.) Maintain historical record of data collected.

Engineer 2, Dugway Proving Grounds - SWMU 192, 870502, U.S. Army Corps of Engineers, Dugway Proving Grounds, UT, 06/2010 - 07/2010
Landfill capping of burial trenches containing spent munitions.

Accomplishments:
Alternate Quality Control Manager - Provided project support for QC activities during the preparation of subgrade to receive geosynthetic clay liner. Inspected work site conditions. Completed daily reports detailing the status of work vehicles/equipment, soil quantities, site quality control, and site health and safety.

Engineer 2, Edwards Air Force Base - Site 3, 136776, U.S. Department of the Air Force, Edwards AFB, CA, 09/2009 - 04/2010
Excavation and consolidation of municipal landfill into smaller footprint in preparation for final landfill capping.

Accomplishments:
Workplan - Authored the Remedial Action Work Plan and figures which describe the technical merits and order of operations for the work. Authored the Waste Management Plan. Posted documents to client's internet portal for review. Worked directly with client to resolve issues.

Engineer 2, Alameda Point Plume 5-3, 124716, U.S. Department of the Navy, Alameda Point, Alameda, CA, 11/2008 - 12/2009
Groundwater heating (six-phase electrical) and vapor extraction to reduce concentration of chlorinated volatile organics in Dense Nonaqueous Phase Liquid (DNAPL) form.

Accomplishments:
Operations and Maintenance - Operated system to maintain stead flow and appropriate ground temperature. Maintained system by draining vacuum lines of condensate, monitoring for volitile organic compounds, and replacing thermocouples. Recorded system measurements in the field (vacuum pressure, ground temperature, current/voltage, etc.) Inspected site conditions.

Analysis - Updated site drawings based on updated field information. Interpreted ground temperature measurements to produce contour maps using Microsoft Excel and Surfer software packages. Performed data review and trend analysis/graphing of system parameters (ground temperature vs. time, estimated mass removal vs. time, power use vs. time, etc.)

03/2008 - 09/2008
Engineer 1, Shaw Environmental & Infrastructure, Inc., Federal, Concord, California

Responsibilities include:

Assisting with the development and implementation of work plans, remedial designs, and other project documentation;

Computer assisted drafting;

Database design/data entry;

And engineering analysis

The following is a summary of key projects:
Engineer 1, El Toro Sites 3 and 5, 129894, U.S. Department of the Navy, Former Marine Corps Air Station El Toro, 03/2008 - Present
Waste Excavation, Consolidation, and Capping Using a Prepared Subgrade, Flexible Membrane

Liner, Geotextile, and Protective Soil Cover.

Accomplishments:
Design - Assisted with the grading and layout plans for the site, including research into the contents of the waste trenches for use in volume calculations. Performed calculations to evaluate the required thickness of the geotextile used to protect the FML from rocks in the protective soil cover, to estimate annual soil loss, and to evaluate surface hydrology and culvert sizing for the design of drainage features. Assisted with the production of Design Drawings.

Work Plan - Assisted with the writing of the main text of the work plan, technical specifications, and work plan figures. Primary author of the Surface Water Control Plan.

Construction - Continued support of project providing updated construction drawings and analysis of field surveys.

Engineer 1, CalTrans Phase V, 115679, Cal Trans, Riverside, CA, 05/2008 - 07/2008
Retrofitting existing power lines

Accomplishments:
Analysis - Used information and measurements from construction drawings to record the number and types of power lines and poles. Designed, implemented, and updated a Microsoft Access database, including creating a user interface and reports.

07/2007 - 01/2008
Engineering Aide (Intern), Tehama County Public Works, Roads, Gerber, California

Computer aided drafting utilizing various AutoCAD ® products

Design of basic traffic structures to CalTrans and local specifications

Recording the GPS position and retro-reflectivity of county roadway signs using MS Access, Excel, CarteGraph Signview ©, and Google Earth

Drainage study calculations using the rational method and US Army Corps of Engineers HEC software

Programming, installation, and retrieval of Nu-Metrics Hi-Star ® Traffic Counters

Miscellaneous duties as needed including assisting with surveys and construction site inspections

The following is a summary of key projects:
Intern, Traffic Control Devices Database, Tehama County, Tehama County, CA, 07/2007 - 01/2008
Project involved labeling and data collection on the retro-reflectivity, GPS coordinates, and condition of all county roadway safety and regulatory signs. The information collected in the field was to be integrated into an existing database using ArcGIS and CarteGraph software. Because the data integration process was still in development, I temporarily imported the data into a MS Access database and create a simple user interface for data collection in the field. Using an online resource, the GPS data was converted and stored to in a single GoogleEarth file which displayed all sign location information on a map with satellite imagery.

Accomplishments:
Cataloged over 2,200 signs in 6 mo.

U.S. ARMY CORPS OF ENGINEERS

PROFESSIONAL DEVELOPMENT SUPPORT CENTER
HUNTSVILLE, ALABAMA

CERTIFICATE

This is to certify that

NIGEL SANDERS

has completed the Corps of Engineers Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS

Given at **Sacramento, CA** (Location) By **Sacramento** (Instructional District) **9 & 10 NOV 2009** (Date)

Expires: November 10, 2014
Verification (916) 557-7708

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE

Facilitator

Chief, USACE Professional Development Support Center

Mark J. Seibert

Professional Qualifications

Mr. Seibert has over 24 years providing technical support, industrial services, hazardous waste management, quality control, and health and safety experience.

From January 2012 to present, Mr. Seibert has diverse experience with various projects such as: Navy FZ01 Treasure Island CA - Operations and maintenance (O&M) Phase III bioremediation of DNAPL, bio-injection and GW sampling, Navy CTO-10 Treasure Island CA - Site Safety Officer (SSO) and sampling of RAD impacted soils, asphalt and concrete, Navy FZN9 Treasure Island CA - Site Safety Officer (SSO), air monitoring and sampling of contaminated soils, Navy TO-0045 Navy Operational Support Center (NOSC) - Site Safety Officer (SSO), Quality Control Manager (QCM), Transportation and Disposal (T&D), excavation, technical and sampling support for petroleum impacted soil, Navy FZN1 Treasure Island CA - installation and sampling for SG vapor wells, DFSP Ozol Martinez CA - biannual low flow GW training and sampling, Defense Fuel Support Point (DFSP) Point Loma, CA - biannual low flow GW training and sampling.

From April 2011 to December 2012, Mr. Seibert supported projects: Navy CTO-0007 Alameda CA - Technical support and construction for 6 Phase Heating System of DNAPL, Aerojet Sacramento CA - Technical support for identifying, locating and surveying expelled rocket propellant at various testing sites, Sacramento Housing and Redevelopment Agency (SHRA) Sacramento CA - Technical Lead, Health and Safety, soil sampling and oversite of UST removal, excavation and remediation on petroleum impacted soil, AFCEE McLellan AFB - Technical and sampling support for lead shot impacted soil, Navy CTO-0006 Alameda CA - Site Safety Officer (SSO), oversight, technical and sampling support of Base Wide Petroleum Data Gaps Investigation.

From September 2005 to March 2011, Mr. Seibert was assigned with construction, operation and maintenance (O&M), BAAQMD, vapor, soil and groundwater sampling, demobilization and site restoration of Thermal, CAT-OX, DVE/SVE, Bio-sparge systems for petroleum impacted soils at Alameda, CA on Navy CTO-0101, FZN2, CTO-0011 CAA-C and CAA-3 projects.

From Aug 2002 to Sept 2005, Mr. Seibert served as the Transportation and Disposal Coordinator for the EFA West Project at Treasure Island, CA. In this capacity, his responsibilities included: importing virgin material, waste characterization, labeling, profiling, manifesting, record keeping, procurement, interface with the Navy's Resident Officer in Charge of Construction (ROICC) and regulatory compliance. Mr. Seibert worked closely with the ROICC to develop a detailed tracking, record keeping, and reporting system necessary for biannual and annual reporting. Mr. Seibert familiarized himself with bioremediation of DNAPL and other projects at Treasure Island, CA.

As Hazardous Waste Coordinator for government services, Mr. Seibert's responsibilities are focused on; hazardous waste identification/classification, profiling, manifesting, transportation and disposal issues. As well as direct contact with disposal facilities to perform profiling functions for waste acceptance, this position also necessitates direct interface with the Navy's

ROICC. Client relations are an important aspect of this position as responsiveness to the client's needs are of the utmost importance.

As Task Manager for Commercial Services, Mr. Seibert's responsibilities are focused primarily on equipment, material and personnel acquisition, field operations, personnel oversight, site health and safety, client interface and regulatory compliance.

Additional Training/Continuing Education

Construction Quality Management for Contractors, Sacramento, CA, 2013
Forklift Operator Training, CB&I, 2013
Site Safety Officer, Shaw E&I, 2011
Competent Person: Drilling Oversight, Shaw E&I, 2006
Rough Terrain/ Warehouse Forklift Training, Ahern, 2006
OSHA 10 Hour Construction Safety, Shaw E&I, 2005
Medic First Aid Training Program, Shaw E & I, 2004
Hazard Communication Training, Shaw E & I, 2003
Personal Protective Equipment, Shaw E & I, 2003
Respirator Program Requirements, Shaw E & I, 2003
HAZWOPER Supervisor Training, Shaw E & I, 2003
H&S Program Management for Project Managers and Supervisors, Shaw E & I, 2003
Hazmat Employee Training (HM 181), Ecology Control Industries, 2001
Confined Space Training, Ecology Control Industries, 2000
Powered Industrial Trucks, Ecology Control Industries, 2000
DOT Function Specific Training, Ecology Control Industries, 1999
Hazardous Materials Training and Testing (HM 126F), Erickson Inc., 1994
40 Hour SARA Hazardous Waste Site Workers Basic Training, Erickson Inc., 1990

Experience and Background

09/2012 - Present
Project Quality Control Manager, Shaw Environmental & Infrastructure, Inc., Federal, Alameda, California

Responsibilities as Project Quality Control Manager are to provide quality control and quality assurance required on federal projects. Routine tasks include preparatory meetings; equipment and material inspections; field log and photo documentation; required testing; daily quality control reports; daily production reports; and final inspections.

04/2011 - Present
Site Safety and Health Officer, Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities as a Site Safety and Health Officer are maintenance and administration of the Health and Safety program on field investigation and construction projects. Routine tasks include site inspections; monthly project audits; resolving safety and health discrepancies; daily safety briefings; writing activity hazard and job safety analyses; worker training on program and site-specific requirements; personnel medical surveillance; air and noise monitoring; system lock out/tag out; confined space entry; hot work; hazardous materials control; personal protective equipment; Health and Safety Plans review; which include Injury and Illness Prevention Plans;

site security; accident investigating, reporting and tracking; accident review boards; daily reports to the client.

04/2011 - Present
Scientist III, Shaw Environmental & Infrastructure, Inc., Concord, California

Responsibilities as a Scientist III are to provide experience, oversite and extensive knowledge on soil and soil vapor sampling, groundwater low flow purging and sampling, continued involvement with Transportation and Disposal of various waste streams, data entry as well as technical lead support for Government and commercial projects.

09/2005 - 04/2011
Scientist III, Shaw Environmental & Infrastructure, Inc., Alameda, California

Responsibilities as a Technical Support Specialist II and Scientist III are overseeing operations of DVE Extraction Projects for government services in Alameda, CA. Responsibilities included; design, construction, operation and maintenance of DVE system, soil, vapor and groundwater sampling, demolition and site restoration.

08/2002 - 09/2005
Technical Support Specialist II, Shaw Environmental & Infrastructure, Inc., Treasure Island, California

Responsibilities as a Hazardous Waste Coordinator for government services are focused on; hazardous waste identification/classification, profiling, manifesting, transportation and disposal issues. As well as direct contact with disposal facilities to perform profiling functions for waste acceptance, this position also necessitates direct interface with the Navy's ROICC.

Responsibilities as a Task Manager for Commercial Services, are focused primarily on equipment, material and personnel acquisition, field operations, personnel oversight, client interface and regulatory compliance.

03/1998 - 08/2002
Senior Operations Supervisor, Ecology Control Industries, Technical Projects, Richmond, California

Responsibilities included serving as Site Superintendent for Lawrence Berkeley National Laboratory. In this capacity, I was responsible for chemical waste handling, segregation, bulking, packaging, labeling, profiling and manifesting of all hazardous and non-hazardous waste generated at LBNL's Berkeley facility. I supervised labor crews responsible for laboratory pick-ups (moving of chemicals from individual labs to accumulation areas), identification of unknown chemicals (haz-cat), laboratory decontamination and emergency spill response.

In addition to LBNL, I actively participated in servicing the system wide contract, which included; UC Berkeley, UC San Francisco, UC Davis, UC Fresno, UC Santa Cruz and all satellite locations associated with the University Systems hazardous waste accumulation program as well as servicing clients such as Santa Clara Valley Water District, Komag, Advanced Polymer, Compaq and Defense Micro Electronics Activity.

10/1988 - 03/1998
Field Technician-Foreman, Laborer, Erickson, Inc., Richmond, California

Responsibilities included supplying oversight and performing work such as industrial remedial services, refinery turn-around projects, chemical cleaning, chemical precipitation, vacuum services, underground and aboveground storage tank (UST/AST) processing, lab-packing, laboratory decontamination, demolition, hydro blasting, operations and maintenance of light duty equipment, equipment manager, inspection of respiratory equipment and emergency response.

Awards/Honors

President's Award, Shaw E&I, 2005
President's Award, Shaw E & I, 2004

U.S. ARMY CORPS OF ENGINEERS

USACE LEARNING CENTER
HUNTSVILLE, ALABAMA

NAVFAC

CERTIFICATE

MARK SEIBERT

#SPK511300600

has completed the Corps of Engineers and Naval Facility Engineering Command Training Course

CONSTRUCTION QUALITY MANAGEMENT FOR CONTRACTORS - #784

SACRAMENTO, CA	4/4-4/5/13	SACRAMENTO/SPK	LARRY J. SMITH, P.E.,CCM
Location	Training Date(s)	Instructional District/ NAVFAC	CQM-C Manager

DREW A. PERRY	DREW.A.PERRY@USACE.ARMY.MIL	(916) 557-7779	Facilitator/Instructor Signature
Facilitator/Instructor	Email	Telephone	

Jeffrey D. Dziedzic

Chief, USACE Learning Center

THIS CERTIFICATE EXPIRES FIVE YEARS FROM DATE OF ISSUE
CQM-C Recertification online course: https://www.myuln.net

Mark J. Vennemeyer

Professional Qualifications

Mr. Vennemeyer has performed waste management activities for twelve (12) years for a variety of clients. At present, he is a Construction Quality Control Manager and has served as Transportation and Disposal Coordinator for Shaw's Government Services division in California. He is responsible for ensuring quality standards of workmanship on various projects, inspection of activities and adherence with contractual requirements, waste characterization/classification, packaging, scheduling, regulatory oversight, providing technical assistance to the Procurement department in matters of Waste Transportation and Disposal Subcontracts, waste sampling, coordination and management of resources necessary to perform off-site transportation and disposal, preparation of waste profiles and shipping papers, and tracking waste shipments to ensure compliance with all applicable regulations.
Mr. Vennemeyer is experienced in "unknown" identification, Treatment Technology requirements, Federal and State (California) waste regulations, and database management. He has been involved in a multitude of waste shipments covering a wide variety of waste streams.

Education

Bachelor of Science, Chemistry, University of California, Irvine, Irvine, California, [redacted]

Additional Training/Continuing Education

First Aid / CPR, Concord, CA, 2007
Site Safety Officer, Irvine, CA, 2006
Construction Quality Management for Contractors, Sacramento, CA, 2005
Shipping Hazardous Materials by UPS, San Jose, CA, 2005
IATA Dangerous Goods Shipment, Emeryville, CA, 2004
Hazardous Waste Manifesting, Alameda, CA, 2002
Cyanide Training, Richmond, CA, 1998
Hazardous Waste Supervisor, Richmond, CA, 1998
Hazard Categorization, San Jose, CA, 1995
Emergency Response Training, San Jose, CA, 1995
Radiation Worker 2, Lawrence Livermore National Lab, 1994
40-Hour Hazardous Waste Operations, Sacramento, CA, 1992

Experience and Background

06/2007 - present
Quality Control Manager / Site Health and Safety Officer, Shaw Environmental & Infrastructure, Inc., Government Services, Alameda, California

Quality Control manager and Site Safety officer at the Alameda Point project(s). Pojects included contruction of in-situ Remediation systems (DVE for petroleum contamination, 6-phase underground heating for DNAPL plume).

04/2006 - 06/2007
Quality Control Manager, Shaw Environmental & Infrastructure, Inc., Government Services, San Francicso, California

Served as Quality Control Manager and T&D Coordinator at former Treasure Island naval base. Acted as liaison between Navy construction personnel (engineers, Construction technicians) and Shaw. Provided daily reporting and documentation of activities performed each day.

12/2005 - 04/2006
Quality Control Manager / Inspector, Shaw Environmental & Infrastructure, Inc., Government Services, San Diego, California

Worked with operations personnel to establish QC procedures and documentation of Navy owned Treatment, Storage and Disposal facility. Inspection of satellite facility(ies) for compliance to Navy and regulatory requirements.

02/2005 - 11/2005
Construction Quality Control Manager, Shaw Environmental & Infrastructure, Inc., Government Services, Concord, California

Responsibilities include support of client projects as quality control manager. Also responsible for interaction with client's technical representatives, preparing portions of reports, oversight of field work, inspection of materials and work performed.

The following is a summary of key projects:
Quality Control Manager, Crow's Landing Flight Facility, 836557, 100358, 101454, U.S. Navy, Crow's Landing Flight Facility, 02/2005 - Present
Quality Control manager for Crow's Landing Flight Facility in Crow's Landing, CA. The project involved several contract task orders (CTOs) to perform different remedial actions. The highlights included:
Removal action of waste soil and debris at former waste pits. Investigation of potential Munitions and Explosives of Concern sites using non-intrusive geophysical surveys and exploratory trenching.

Awards/Client Commendations:
President's Safety Award

05/2002 - 02/2005
Transportation and Disposal Coordinator, Shaw Environmental & Infrastructure, Inc., Government Technical Services, Concord, California

Responsibilities include providing technical support for clients as a transportation and disposal coordinator. Also responsible for waste characterization, profiling, manifesting, coordination of subcontractors and disposal facilties for remedial actions, waste tracking and technical documentation of removal / disposal actions.

The following is a summary of key projects:
T&D Coordinator, Carmel Valley Manor, , JM Electric, Carmel, CA, $20,000.00, 03/2005 - 03/2005
Removal and disposal of aged transformers and electrical equipment. Tasks included sampling, characterizing, profiling, manifesting, packaging of equipment according to all applicable federal,

state and local regulations.

Transportation and Disposal Coordinator, Hunters Point Shipyard, various, U.S. Navy, San Francisco, CA, 02/2002 - 02/2005
Transport and Disposal Coordinator for various projects at Hunters Point. Responsible for waste sampling, characterization, profiling, manifesting, coordination of waste shipments and technical documentation of disposal activities.
During the span of the project, over 20,000 tons of waste was removed from site and sent to various permitted treatment/disposal facilties.

Transportation and Disposal Coordinator, Alameda Point, former Alameda Naval Air Station, various, U.S. Navy, Alameda, CA, 02/2002 - 02/2005
Coordination of disposal activities for various remedial projects at the Former Alameda Naval Air Station. Tasks included Investigation Derived and Treatment by-product Waste sampling, characterization, profiling, manifesting and coordination of disposal.

Awards/Client Commendations:
President's Safety Award

Transport and Disposal Coordinator, ORC - Cyril, 100735, US EPA, Cyril, OK, $6,000,000.00, 09/2003 - 06/2004
Demolition of a shut-down oil refinery. Disposal of all wastes associated with the facility including petroleum by-products, chemical catalysts, construction demolition debris, abandoned drummed wastes and "laboratory size" chemical bottles.
Much of the structure was recycled as scrap metal, but the area was cleared of Asbestos prior to any demolition activites starting.

Transport and Disposal Coordinator, Hamilton Army Airfield, US Army Corp of Engineers, Novato, CA, 05/2002 - 12/2002
This project was the removal from site and disposal of several thousand tons of waste excavated soil that was staged on site at an Army Airfield that was in closure. Tasks included classification of waste based on analytical results of samples, profiling of waste to seleceted TSDFs, tracking of waste shipments (using the manifest shipping documents) and confirmation of costs associated with transportation and disposal of waste.

12/2000 - 02/2002
Transportation and Disposal Coordinator, IT Corporation (The Shaw Group Inc. acquired substantially all of the operating assets of The IT Group, Inc., on May 23, 2002), Government Services, Concord, California

Responsibilities included providing technical support to client projects as Transport and Disposal coordinator. Also responsible for field support of waste disposal operations, support of business development activities and composition of certain technical sections of reporting documents.

NAVAL FACILITIES ENGINEERING COMMAND SOUTHWEST

U.S. ARMY Corps of Engineers

US Army Corps of Engineers®

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PRESENTS THIS CERTIFICATE TO

Mark Vennemeyer

WHO HAS SUCCESSFULLY COMPLETED

January 28 & 29, 2010

U.S.A.C.E. Construction Quality Management for Contractors

Kugan Panchadsaram PE, PMP
CQM Facilitator
Kugan & Associates Inc.

San Diego Chapter, Inc
"Building Your Quality of Life"

Glen Schaffer
AGC-San Diego Director of Marketing & Education
CQM Training Coordinator

This Certificate is valid for 5 years from the date above

Attachment 5
Outside Organizations

Outside Organizations

Organization Name/Address/Phone	Description of Services
(none planned)	

Attachment 6
Submittal Register

SUBMITTAL REGISTER

CONTRACT NUMBER
N62473-12-D-2005
CTO 0005

Title and Location: Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units, Former Naval Station Treasure Island, San Francisco, California

Contractor
CB&I Federal Services LLC

Specification Section
Scope of Work

Transmittal No.	Item No.	Specification Paragraph No.	Description of Item Submitted	Type of Submittal									Classification		Reviewer	Contractor Schedule Dates			Contractor Action			Government Action		Remarks
				Data	Drawings	Instructions	Schedules	Statements	Reports	Certificates	Samples	Records	Information only	Government approved		Submit	Approval needed by	Material needed by	Code	Date	Submit to government	Code	Date	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	01	SOW, 6.0	Kick-off Meeting Materials		X		X							X										1 day prior to meeting
	02		Kick-off Meeting Minutes									X		X										5 days after meeting
	03		Team/Routine Meeting Materials		X		X							X										2 days prior to scheduled meeting, as needed
	04		Project Schedule				X							X										7 days from contract award. Update weekly
	05		Team/Routine Meeting Materials		X		X							X										2 days prior to scheduled meeting, as needed
	06		Fact Sheet	X	X		X							X										14 days after award
	07		Internal Draft Planning Documents		X		X	X						X										14 days from contract award – allow 7 days for Navy review
	08		Response to Navy/Agency Comments					X						X										5 days from receipt of Navy comments
	09		Draft Planning Documents		X		X	X						X										5 days from resolution of Navy comments
	10		Response to Navy/Agency					X						X										5 days from receipt

SUBMITTAL REGISTER

CONTRACT NUMBER
N62473-12-D-2005
CTO 0005

Title and Location: Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units, Former Naval Station Treasure Island, San Francisco, California

Contractor
CB&I Federal Services LLC

Specification Section
Scope of Work

Transmittal No.	Item No.	Specification Paragraph No.	Description of Item Submitted	Type of Submittal									Classification		Reviewer	Contractor Schedule Dates			Contractor Action			Government Action		Remarks
				Data	Drawings	Instructions	Schedules	Statements	Reports	Certificates	Samples	Records	Information only	Government approved		Submit	Approval needed by	Material needed by	Code	Date	Submit to government	Code	Date	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
			Comments																					of Navy/Agency comments
	11		Final Planning Documents		X		X	X					X											3 days after resolution of comments and receipt of Navy approval
	12		QC/Rad Reports	X	X				X					X											daily
	13		Internal Draft Survey Completion Report (including HHRA)	X	X				X			X		X											14 days after field work – allow 7 days for Navy review
	14		Response to Navy Comments					X						X											5 days from receipt of Navy comments
	15		Draft Survey Completion Report (including HHRA)	X	X				X			X		X											7 days after comments addressed – allow 60 days for Regulatory review
	16		Response to Regulatory Agency/RAB Comments					X						X											5 days from receipt of Regulatory comments
	17		Draft Final Survey Completion Report (including HHRA)	X	X				X			X		X											3 days after resolution of comments – allow 30 days for regulatory review

SUBMITTAL REGISTER

CONTRACT NUMBER
N62473-12-D-2005
CTO 0005

Title and Location: Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units, Former Naval Station Treasure Island, San Francisco, California

Contractor
CB&I Federal Services LLC

Specification Section
Scope of Work

Transmittal No.	Item No.	Specification Paragraph No.	Description of Item Submitted	Type of Submittal									Classification		Reviewer	Contractor Schedule Dates			Contractor Action			Government Action		Remarks
				Data	Drawings	Instructions	Schedules	Statements	Reports	Certificates	Samples	Records	Information only	Government approved		Submit	Approval needed by	Material needed by	Code	Date	Submit to government	Code	Date	
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y
	18		Response to Regulatory Agency/RAB Comments					X						X										5 days from receipt of Regulatory comments
	19		Final Survey Completion Report (including HHRA)	X	X				X			X	X											7 days after resolution of comments and receipt of Navy approval

Attachment 7
Testing Plan and Log

Testing Plan and Log

Contract No. N62473-12-D-2005 Contract Task Order 0005			Former Naval Station Treasure Island San Francisco, California							Contractor CB&I	
Specification Section and Paragraph Number	Test Procedure	Test Name	Accredited/ Approved Laboratory		Sampled By	Location of Test On Site or Off Site		Frequency of Test	Date Completed	Date Forwarded to Contracting Officer	Remarks
			Yes	No							
*											

Notes:

** No testing is planned*

CB&I CB&I Federal Services LLC

Attachment 8
Definable Features of Work Matrix

Definable Features of Work Matrix
Final
Contractor Quality Control Plan
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California
Contract Number N62473-12-D-2005
Contract Task Order 0005

Plan/ Specification Section	Schedule Cross Reference	Feature of Work	Task Lead	Preparatory	Initial	Follow-Up	Completion
TSP/Section 7.0	W.E. 4	Radiological Scoping Survey	Ray Schul	Ray Schul	Ray Schul	Takeshi Ibuki	Takeshi Ibuki/ John Massey
TSP/Section 10.0	W.E. 4 and 5	Fieldwork Reports and Data Analysis	Ray Schul	Ray Schul	Ray Schul	Takeshi Ibuki	Takeshi Ibuki/ John Massey

Notes:

TSP *task-specific plan*

W.E. *work element*

Attachment 9
Organization and Personnel Certifications

Organization and Personnel Certifications Log
Final
Contractor Quality Control Plan
Radiological Scoping Surveys of Installation Restoration Site 12 Housing Units
Former Naval Station Treasure Island
San Francisco, California
Contract Number N62473-12-D-2005
Contract Task Order 0005

Definable Feature of Work	Certification Requirement	Code	Organization	Individual	Verified by/Date Verified	Certificate Expires
*						

Legend:

** No specific certification requirements identified.*

Column 1, Definable Feature of Work: Refer to Construction Quality Control Plan table for list of definable features of work. List in order.

Column 2, Certification Requirement: State the certification required for the subcontractor, supplier, and/or individual.

Column 3, Code: S = Certificate required for the firm, that is, subcontractor or supplier; P = certificate required for the person performing the work.

Column 4, Organization: Subcontractor or supplier organization name.

Column 5, Individual: Name of certified individual (note: if certification requirement only applies to the firm, note name of person who provided certificate).

Column 6, Verified By/Date Verified: CB&I individual who verified certificates for organization and/or individuals. Verification required no later than Preparatory Inspection.

Column 7, Certificate Expires: Note the certificate expiration date.

Notes:

This log will be included in the Construction Quality Control Plan as an appendix with Columns 1, 2, and 3 are filled in. Remaining columns will be completed when information becomes available.

CB&I CB&I Federal Services LLC

Attachment 10
Procedures

PROCEDURE

Procedure Title:	**Quality Management Organization**	**CMS Number:**	**CMS-720-01-PR-00130**
Procedure Owner:	**Corporate Quality**	**Issuing Authority:**	**Group VP Global Services**

QUALITY MANAGEMENT ORGANIZATION

0	Issued for Use	DLK	17 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure defines the roles and responsibilities and the associated processes within the CB&I Quality Management Organization.

2.0 SCOPE

This procedure applies to CB&I Corporate and all Project Operations Units as well as their supporting operations.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this procedure:

- CB&I Management with Executive Responsibility;
- Corporate Director, Global Quality Management;
- Project Operations Unit Quality Managers.

4.0 PROCEDURE

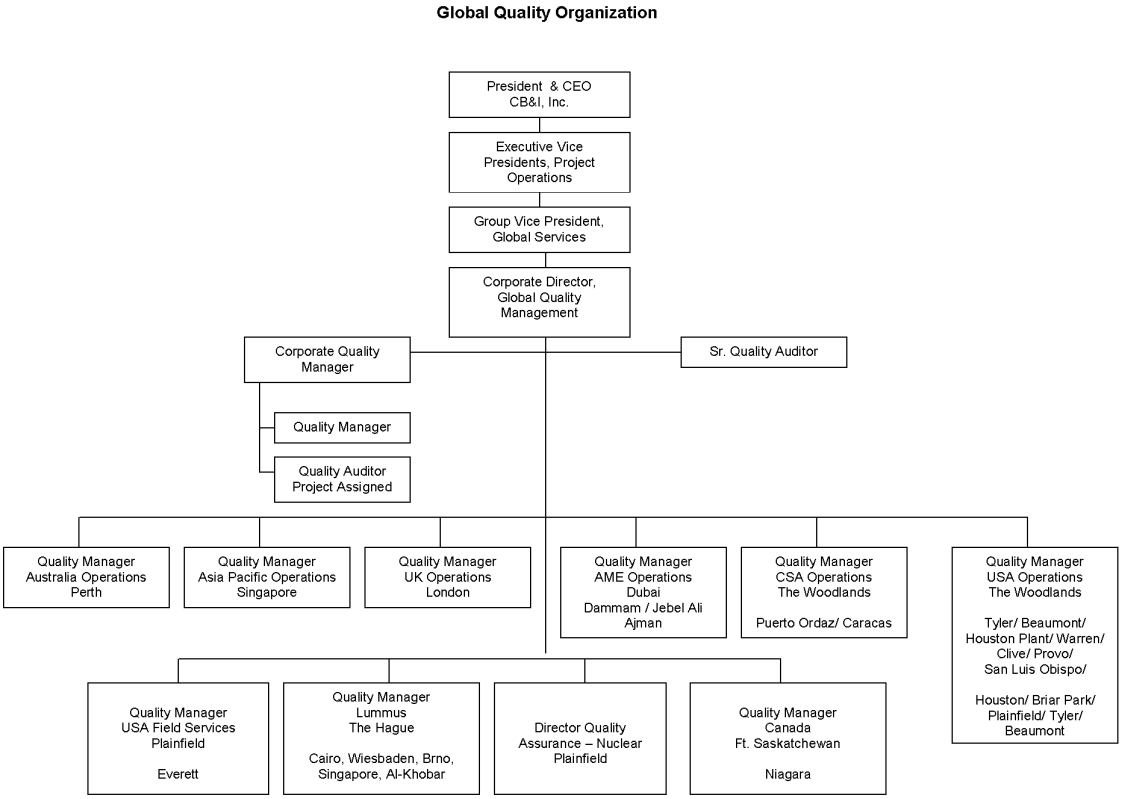
4.1 General

4.1.1 CB&I Management with Executive Responsibility is responsible for providing the resources necessary to assure the effective implementation of the CB&I Management System (CMS). Executive Management is also responsible for monitoring the QMS organizational structure via the CMS Management Review process including staffing, resources and training.

4.1.2 The Corporate Director, Global Quality Management (GQM), has the authority and responsibility for assuring the CB&I Quality System requirements are effectively established and monitored on a global basis. The Corporate Director, GQM, reports on the performance of the global quality system on an annual basis to CB&I executive management to assure continued maintenance and improvement of the global quality system.

4.1.3 The Project Operations Unit Quality Managers have the authority and responsibility for assuring Quality System requirements are effectively established and monitored in their geographic region.

4.2 QUALITY ORGANIZATION



4.3 CORPORATE DIRECTOR, GLOBAL QUALITY MANAGEMENT; QUALITY MANAGERS, PROJECT OPERATIONS

CB&I's Corporate Director, Global Quality Management, collaborates with each of the Project Operations Unit Quality Managers to establish business processes that are consistent with those of other Project Operations Units throughout CB&I. Elements of these unified and consistent global business processes include the following:

- Establishing sequence and interaction of business processes;
- Establishing criteria and methods needed to assure effective process control;
- Assuring the availability of resources and information necessary to support the operation and monitoring of these processes;
- The monitoring, measurement, and analysis of these processes;
- The implementation of continual improvement initiatives of these global processes in order to achieve improved results, and
- Meeting and improving upon global quality objectives.

4.4 DIRECTOR, QUALITY ASSURANCE, NUCLEAR

CB&I's Director, Quality Assurance (QA), Nuclear is responsible for the Quality Assurance activities associated with the CB&I Nuclear Power initiatives. The Director, QA, Nuclear, provides the knowledge and expertise in understanding and interpreting the Nuclear codes and regulations and conveying this information to the applicable CB&I functional owners. The Director, as well, works with the various Accreditation bodies to obtain the necessary approvals to allow CB&I to conduct its Nuclear Power initiatives within the U.S. As well, the Director ensures the proper educational and experience requirements of the nuclear inspectors are met and maintained.

4.5 MANAGER, CORPORATE QUALITY; STAFF

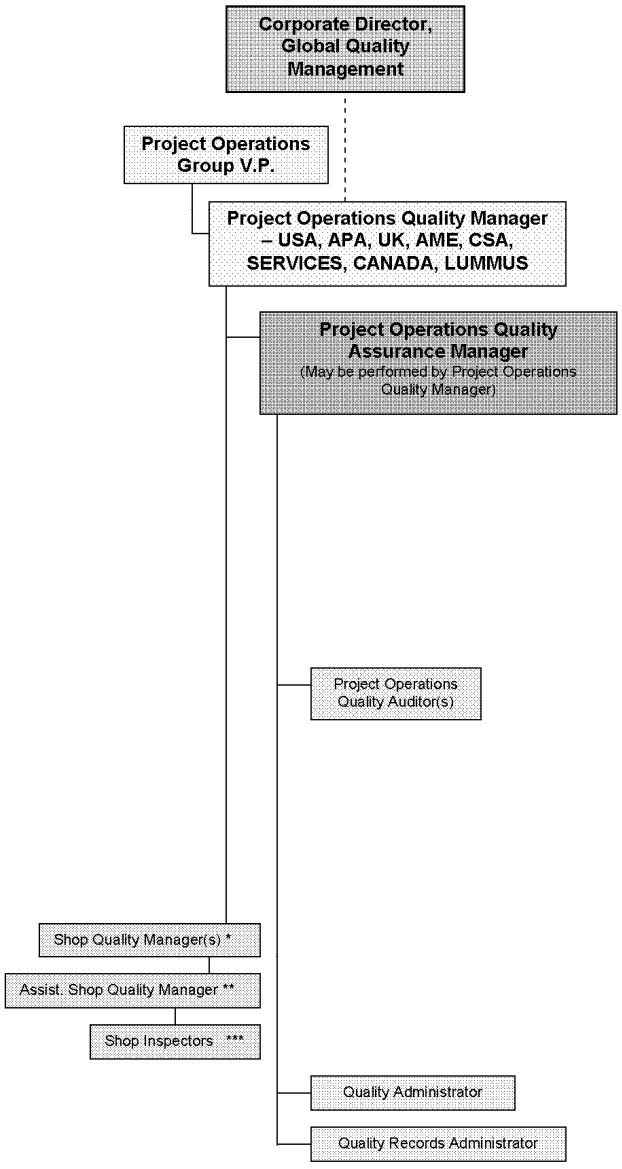
The Corporate Quality Manager and staff are responsible for directing Quality Systems initiatives within CB&I meeting the requirements of the ISO 9001 Standard. Specifically, the Corporate Quality Management group partners with functional Process Owners to drive major Quality Systems initiatives within the following areas:

- CB&I Quality Systems support using the ISO 9001 as a basis for process development and optimization, procedure development, data collection and reporting, and Quality Systems training.
- CB&I Quality Systems establishment and support of the global audit schedule, conducting global Quality Systems audits and facilitating associated corrective actions.
- CB&I Corrective Action/ Preventive Action and Nonconformance tracking program development including defining requirements and future administration and support of a unified, global system to include tracking of NCR's, CAR's, Audit Findings, etc.
- CB&I Quality surveillance program development including defining requirements and future administration and support of a unified, global system to include tracking surveillance parameters of CB&I subcontractors.
- CB&I weld tracking program development including defining requirements and future administration and support of a unified, global tracking system.
- CB&I administration, continued support and improvement of the CB&I Management System.
- Supporting the Director, Global Quality Management in facilitating Global Quality Leadership meetings, achieving present Quality objectives, setting future Quality objectives and providing input and coordinating output from the Global Quality Management Reviews.

4.6 TYPICAL QUALITY STAFFING PLAN

A typical Quality Staffing Plan within a Project Operations Unit is depicted as follows. General descriptions of the positions are included. In general, the Project Operations Unit Quality Managers are responsible for all Project Operations Unit Quality Program activities and reports to the Corporate Director, GQM and is teamed to the associated Group Vice President, Project Operations. For smaller projects, functions may be combined or in some cases would not exist.

TYPICAL QUALITY STAFFING PLAN



Responsible for Global Quality Program Activities.

Responsible for Project Operations Quality Program Activities; Reports to Corporate Director, Global Quality Management, teamed to Group VP, Project Operations;

Responsible for execution of the Quality Policy and administration of Project Operations Quality Personnel.

Responsible for Quality Assurance Activities within the Project Operations Unit:

- Reports directly to the Project Operations Quality Manager.
- Establishes and implements the annual audit schedule for the Project Operations Unit.
- Assures adequate resources are available for performing audit activities.
- Coordinates with other Project Operations Units for resource utilization.
- Acts as Lead Auditor during Project Operations audits.
- Assures audits are performed using current documentation.
- Assures audit findings are documented, and analyzed for Corrective and Preventive Actions (CA/ PA).
- Assures information regarding significant audit findings and resolutions are shared with other Project Operations Units.
- Assures Project Operations Unit obtains and/or maintains all required code stamps, certificates and ISO

Responsible for performing Quality audits and other assignments under direction of Project Operations Quality Assurance Manager:

- Performs Quality audits per the annual audit schedule.
- Records audit findings and recommends resolution.
- Coordinates with Project Operations personnel to assure audit findings are adequately addressed, resolved and closed.
- Assures implementation of Corrective and Preventive Actions.
- Assists Project Operations QA Manager in obtaining and/or maintaining all required code stamps, certificates and ISO certifications.
- May be trained and perform as a Lead Auditor.
- May be cross-trained / qualified to perform audits in more than one discipline.

* Responsible for all Quality related activities in a fabrication facility.

** Assists Shop Quality Manager in directing shop inspection activities.

*** Performs shop fabrication inspections – multi-discipline.

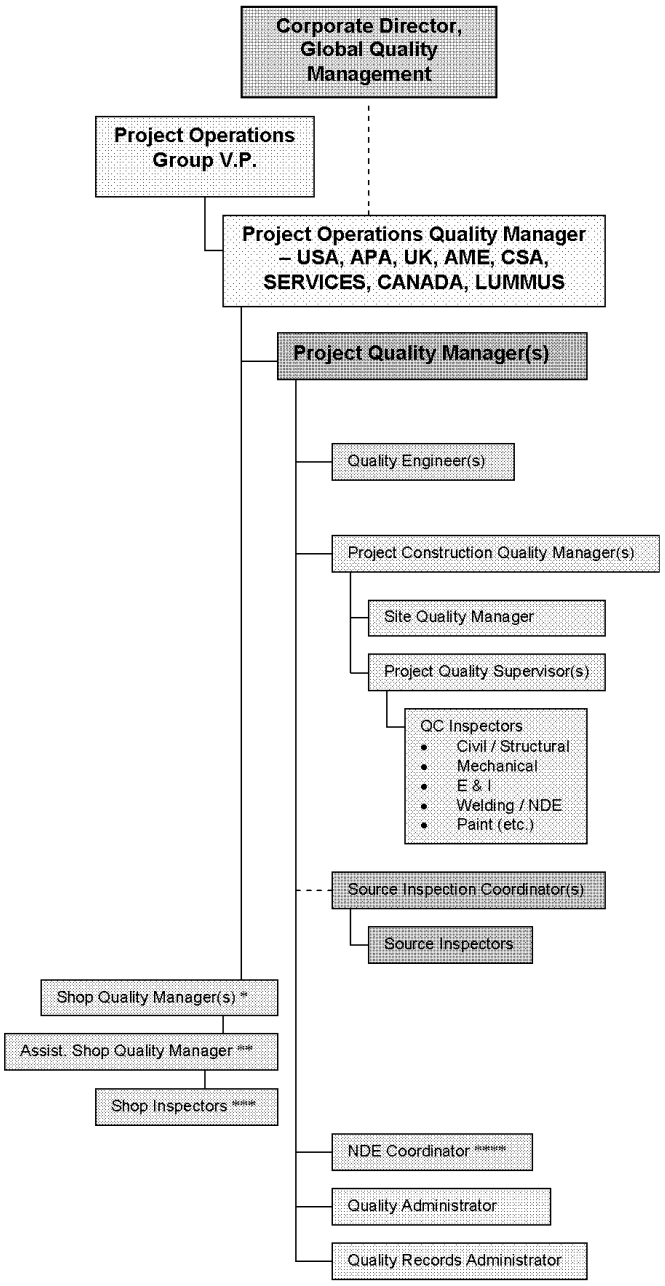
Performs administrative and clerical tasks assigned by Project Operations QA Manager.

Collects, stores, and maintains Quality records for the project.

4.7 TYPICAL PROJECT QUALITY STAFFING PLAN

A typical Project Quality Staffing Plan within a Project Operations Unit is depicted as follows. General descriptions of the positions are included. Similarly as described above, the Project Operations Unit Quality Managers are responsible for all Project Operations Unit Quality Program activities and reports to the Corporate Director, GQM, and is teamed to the associated Group Vice President, Project Operations. For smaller projects, functions may be combined or in some cases would not exist.

TYPICAL PROJECT QUALITY STAFFING PLAN



Responsible for Global Quality program activities.

Responsible for Project Operations Quality Program Activities; Reports to Corporate Director, Global Quality, teamed to Group VP, Project Operations;

Responsible for execution of the Quality Policy and administration of Project Operations Quality personnel.

Ultimate responsibility for Quality related project activities; Responsible for Project Quality Plans, staffing and auditing, as applicable.

Provides technical support to the Project Quality Manager (PQM). Assures code, client, regulatory and CB&I requirements are incorporated into project documents and technical specifications for each project. Creates Project Quality Plans. Performs Quality Engineering functions under direction of PQM.

Responsible for Quality related construction activities on a project (May have several small projects). Responsible for Subcontractor Quality Surveillance Program.

Assures self perform and subcontractors work complies with Contract Quality Requirements.

Directs Quality inspection activities on a project.

ALL DISCIPLINES

Performs Quality inspections under direction of Quality Supervisor; May be cross-trained and certified in more than one discipline.

Responsible for supplier source inspections for a project. (Reports directly to Project Procurement Manager).

Performs supplier source inspections – may be 3rd party. (Provided by Procurement – may utilize CB&I inspectors).

* Responsible for Quality related activities in a fabrication facility.

** Assists Shop Quality Manager in directing shop inspection activities.

*** Performs shop fabrication inspections – multi-discipline.

**** Coordinates NDE activities at the site.

Performs administrative and clerical tasks on a project.

Collects, stores, and maintains Quality records for the project.

4.8 TYPICAL PROJECT QUALITY STAFFING DESCRIPTIONS

4.8.1 PROJECT QUALITY MANAGER

The Project Quality Manager (PQM) is responsible for defining and developing strategies and plans to assure compliance with established Codes, Standards, Regulations, Policies, Procedures and Contractual Requirements. The PQM reports to the Project Director on a day-to-day basis and to the Project Operations Unit Quality Manager on technical matters relating to Quality. The PQM is ultimately responsible for the Project Quality Plan.

4.8.2 QUALITY ENGINEER(s)

Quality Engineer(s) assist in all areas of quality involving pre-contract planning. The Engineers review and understand the Project Construction Plan, Installation Procedures, Welding and Associated Procedures (PWHT, WPS, NDE, etc.), Test Procedures, Codes, Specifications, and Drawings. They assure Code, Client, Regulatory and CB&I requirements are incorporated into project documents and technical specifications for each project. In addition, they develop Project Quality Plans, review procurement documents for inclusion of quality requirements, monitor Projects for compliance to quality requirements and programs in place and assists the Project Quality Manager with Client and Construction interfaces.

4.8.3 PROJECT CONSTRUCTION QUALITY MANAGER

The Construction Quality Manager (CQM) is responsible for assuring the construction quality control requirements of the Project Quality Plan, Commissioning and Subcontracts Plans, are documented and approved. The CQM is responsible for the Construction Quality, where required by the project. The CQM assures the construction quality control requirements are understood and construction work is performed in accordance with Project Quality Plan, Applicable Codes, Policies, Procedures, Drawings and Specific Contract Requirements. The CQM is also responsible for all CB&I site quality control personnel performing inspection, surveillance and testing activities. The CQM reports to the Site Construction Manager on a day-to-day basis and to the Project Quality Manager on technical matters relating to Quality.

4.8.4 SITE QUALITY MANAGER

The Site Quality Manager reviews and understands the Project Quality Plan including self perform and subcontractor(s) Quality Plans as well as Inspection and Test Plans for compliance. The Site Quality Manager reviews subcontractor(s) welding procedures, codes, specifications and drawings for compliance. In addition, they coordinate the monitoring/ inspection/ surveillance activities of subcontractor(s) to assure compliance with the project requirements. The Site Quality Manager is the CB&I Quality Control (QC) department interface with subcontractor(s) and Client QA/QC personnel as well as a communication interface with CB&I Construction Management. The Site Quality Manager reports to the Construction Manager on a day-to-day basis and to the Construction Quality Manager on technical matters relating to quality.

4.8.5 PROJECT QUALITY SUPERVISOR

The Project Quality Supervisor (PQS) reviews and understands the Project Quality Plan, Welding and Associated Procedures (Post Weld Heat Treatment (PWHT), WPS, NDE, etc.), Test Procedures, Codes, Specifications and Drawings. The PQS assures implementation of required Quality Control Inspections and Quality Documentation to support the project schedule and client requirements. The PQS develops project specific Quality procedures, inspection & test plans, develops and maintains required project quality records/documents and develops and maintains inspection and Nonconformance Report (NCR) logs. The PQS coordinates and supervises daily work

activities of QC Inspectors. In addition, the PQS is the CB&I QC department interface with client QA/QC personnel and communication interface with CB&I Construction Management.

4.8.6 QUALITY CONTROL (QC) INSPECTORS

QC Inspectors perform inspections and surveillance activities as directed by Quality Supervision to assure that work is performed as required by the Project Quality Plan, codes, specifications, drawings, procedures and contract. The QC Inspector assures the required documentation/ records are generated, maintained and includes the details of all inspections/ surveillances performed. Inspectors shall only perform inspections/surveillances for which they have been previously qualified by training. Inspectors interact cross-functionally with project team members and management. They provide input into Project Quality Management reports.

4.8.7 NON-DESTRUCTIVE EXAMINATION (NDE) COORDINATOR

The Non Destructive Examination (NDE) Coordinator manages the NDE inspections and liaises with the subcontractor for NDE inspections. The coordinator assures that all NDE Quality records are maintained within the project tracking system. They assist the Commissioning group with the development of work packages and system turnover. The coordinator issues periodic Weld/NDE status reports to Project Quality and Construction Management.

4.8.8 QUALITY ADMINISTRATOR

The Quality Administrator assists members of the Quality team in compiling quality records. They input data into the weld tracking data base including weld histories, material traceability and records of NDE's performed. The Coordinator maintains records to include the details of all inspections and assists the NDE Coordinator with the development of work packages and system turnover records.

4.8.9 SOURCE INSPECTION COORDINATOR

The Source Inspection Coordinator, who reports directly to the Project Procurement Manager, reviews and understands procurement specifications and contract quality requirements for externally supplied equipment/ materials for CB&I projects. The coordinator partners with the Project Quality Manager to provide required supplier quality surveillance and inspection services (source inspections). The Coordinators schedule personnel for performing supplier quality surveillances/ inspections to support project schedules including the development and maintenance of supplier surveillance/ inspection records and documentation. The coordinator assures surveillance/ inspection personnel are knowledgeable, qualified and/or certified for the externally supplied equipment/ material surveillance/ inspection activities which they are performing. They schedule and coordinate with third party inspection agencies when required to perform surveillance/ inspection activities.

5.0 REFERENCES

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary
CMS-720-01-PR-00150	Identification, Control and Disposition of Nonconforming Products
CMS-720-01-PR-00170	Corrective/ Preventive Action
CMS-720-01-PR-00180	Measurement, Analysis & Improvement
CMS-720-01-PR-00220	Internal Quality Management System Audits
CMS-720-01-PR-00230	Subcontractor Quality Surveillance Program

CMS-720-01-PR-00240 Quality System Management Review

6.0 TERMINOLOGY

None

7.0 EXHIBITS

None

1. PURPOSE

This procedure describes the process and responsibilities for stopping work associated with items, condition, or issues that are identified as significantly adverse to quality. This procedure also provides requirements for issuing, resolving, and verifying acceptable responses/actions when work is stopped.

2. SCOPE

This procedure applies to quality-related activities for Shaw E&I and its subcontractors. This procedure does not apply to Stop Work Orders based on unsafe conditions or for health and safety related concerns or activities, which is addressed by EIG-HS-040, “Stop Work Authority.”

3. REFERENCES

- EI-MAN-Q001, *Quality Management System Manual*
- Shaw Procedure No. EIG-HS-040, “Stop Work Authority”
- Shaw Procedure No. EIG-Q-007, “Nonconformance Reporting”

4. DEFINITIONS

- **Stop Work**—A notice issued to project management to stop further processing, delivery, installation, or operation within the surrounding or affected area when a nonconformance, deficiency, or unsatisfactory condition is identified that meets a significant stop work criteria as defined in Section 6.2.
- **Suspend Work**—A notice by which work is halted due to a potential nonconformance, deficiency, or unsatisfactory condition that may be detrimental to quality. Normally these issues can be corrected through established processes, and activities may resume once the issue is corrected.

5. RESPONSIBILITIES

5.1 Responsible Manager

The Responsible Manager must suspend or stop work upon receiving a Stop Work Notice. He/she is responsible for determining the extent of the condition and ensuring that the notice is acknowledged and responded to in a timely manner. He/she must lead the effort of identifying, reviewing, and approving the resulting corrective actions and ensuring completion and closure.

5.2 Project Quality Representative

The Project Quality Representative is responsible for issuing a Stop Work Notice when conditions warrant, and for verifying associated corrective actions are accomplished. The Project Quality Representative must immediately notify the Responsible Manager that a Stop Work Notice has been issued. The Project Quality Representative shall maintain the stop work notice documentation, perform verification that the approved corrective action is completed, and notify responsible management of its closure. For projects without a project quality representative, the Responsible Manager shall assume these responsibilities.

5.3 All Employees

All employees have the responsibility to suspend a work activity in the event that a potential condition adverse to quality that meets the criteria in Section 6.2 develops. Employees must immediately notify the Responsible Manager and Project Quality Representative to have the condition evaluated and documented.

6. PROCEDURE

Work shall be suspended in the event a potential condition adverse to quality is encountered in accordance with Section 6.1. Work shall be stopped if significant conditions adverse to quality are observed that meet the criteria identified in Section 6.2. If unsafe conditions or other health and safety violations are observed and a Stop Work Order is considered or given, refer to EIG-HS-040.

6.1 Suspend Work

All employees have the right and responsibility to suspend a particular work activity in the event that a potential condition adverse to quality develops.

If a potential condition adverse to quality is identified, then the Project Quality Representative must be contacted immediately and, if possible, the problem will be corrected at that level. If the problem cannot be corrected, then the Project Quality Representative or employee shall contact the Responsible Manager to have the problem corrected. Problems that are corrected shall be documented (e.g., Daily Report).

If the issue or problem cannot be corrected, the work activity will be suspended until the condition is corrected and documented in project records. If the subject condition cannot be resolved, the suspension of work activity in that area will be elevated to a stop work notice.

6.2 Stop Work Notice Criteria

The following criteria are to be used as a guide for determining whether to issue a stop work notice:

- Continuing an operation will directly affect the integrity of the work or documentation that is required and would result in significant rework
- Continuing an operation will jeopardize the integrity of the design or compromise the essential features that are important to project objectives or safety
- Continuation of work would result in unacceptable delay for corrective actions to be taken
- Continuing an operation that is not performed in accordance to work plans or acceptable industry practices that may cause personnel injury or property damage
- Continuing an operation would result in a condition adverse to quality as a result of unplanned or unanticipated conditions and lack of appropriate controls
- Continuing an operation would result in the inability to implement established and required Quality Control activities
- Continuing an operation would result in covering up or concealing non-conforming work

6.3 Issuance of the Stop Work Notice

When personnel determine that activities have the potential to detrimentally affect quality in accordance with the criteria in Section 6.2, a stop work notice shall be issued. The Project Quality

Representative and Responsible Manager shall be notified when personnel see the need for a stop work notice for quality issues.

6.3.1 Management Notification

Upon determination that the criteria for issuing a stop work applies, the Responsible Manager will be notified immediately that a stop work condition exists. If the Responsible Manager for the affected activity is not on site, then the highest level of management on site will also be notified as soon as possible.

Upon notification, all potentially affected operations or activities at the subject location shill cease immediately.

Project or activity management shall be notified when the stop work is effective and to what activities the stop work applies. Other activities may proceed normally if the potential condition has no effect upon that activity.

6.3.2 Written Issuance

The Project Quality Representative, with the help of any issuing personnel, must issue a written stop work notice to the Project Manager as soon as practical after verbal notice is given. The stop work notice shall include a description of the conditions and the criteria under which it is written, and should include photographs as applicable. As applicable, any nonconformance shall be included in accordance with EIG-Q-007, “Nonconformance Reporting.”

6.3.3 Response and Coordination

The project or activity management shall develop a corrective action plan and establish a date for completion. The Responsible Manager and the Project Quality Representative will then sign the stop work notice, signifying agreement with the corrective actions planned. Management shall proceed with performing the agreed upon corrective action and notify the Project Quality Representative when completed. The Responsible Manager shall also provide any objective evidence or other supporting information to the quality representative.

6.4 Stop Work Notice Closure

6.4.1 Corrective Action Verification and Closure

Upon verification of satisfactory completion of the corrective action, the Project Quality Representative shall close the corrective action and document the closure on, or as an attachment to, the stop work notice. Corrective action verification information and/or objective evidence will be included with the stop work notice.

6.4.2 Resume Work Notification

Once the issue or activities of concern are appropriately addressed, the Project Quality Representative will notify the Responsible Manager and any on-site management that they may resume work. This notification may be performed verbally, but shall be documented and included with the stop work notice. Project or activity work may proceed if immediate corrective actions are completed and are sufficient to satisfy the criteria in Section 6.1, but long-term corrective actions have not been completed as determined by the Project Quality Representative.

7. ATTACHMENTS

None

8. FORMS

- EIP-Q-002.01, Stop Work Notice

9. RECORDS

- EIP-Q-002.01, Stop Work Notice
- Nonconformance Report

10. REVISION HISTORY AND APPROVAL

Revision Level Revision Date	Revision Description	Responsible Manager
00 04/14/2003	Initial issue	Cheryl Prince
01 12/27/2011	Modified format to align with Governance Management framework. 5.2 Project Quality Representative, added Responsible Manager to assume the responsibility of the Quality Representative for projects without a Quality Representative.	Bryan Koehler

Stop Work Notice Identifier: _____

Project or Activity: _____

Date/Time Effective: _____

Person Identifying/Issuing: _____

Condition Observed and Significance to Quality:

Applicable Scope of Activity:

Criteria violated (as defined in Section 6.2 of procedure EIP-Q-002, *Stop Work Notice for Quality Related Issues*):

Notification:

Project Quality Representative: _____
Name Date/Time notified

Responsible Manager: _____
Name Date/Time notified

Corrective Action Proposed:

Date of Completion: _____

Responsible Manager: _____
Signature Date

Project Quality Rep. Concurrence: _____
Signature Date

Corrective Action Verification and Closure:

Project Quality Representative: _____
Signature Date

Date Work Resumed: _____

PROCEDURE

Procedure Title:	**Project Quality Plans**	**CMS Number:**	**CMS-720-01-PR-00120**
Procedure Owner:	**Corporate Quality**	**Issuing Authority:**	**Director Global Quality**

PROJECT QUALITY PLANS

5	Issued for Use – Total rewrite for new Project Procedures Manual Process. (No Rev Bars)	PDJ	17 Oct 2013
4	Issued for Use – Revised 1.0 Purpose, 4.0 Procedure and 5.0 References. (See Rev Bars)	BDO	01 Apr 2010
0	Issued for Use	GB	29 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

Project Quality Plans (PQPs) are used by CB&I to identify project procedures and supporting documentation to be used for project execution. This includes identifying the critical CMS documents used to control and attain designed product quality and to meet contractual and regulatory obligations. A PQP can also define the Quality objectives specific to the work covered by the plan and the resources and responsibilities assigned.

This procedure describes the structure of PQPs and the responsibilities for the implementation of Quality Plans.

2.0 SCOPE

This procedure applies to all CB&I projects and pre-contract activities when required for a given proposal.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this procedure:

- Business Development Managers (BDM)
- Proposal Managers
- Project Managers / Project Directors
- Quality Managers

4.0 PROCEDURE

4.1 Quality Plans – Pre-contract

4.1.1 When a Quality Plan is required as part of a proposal, the relevant Quality Manager shall coordinate with the Proposal Manager or, if necessary, the Business Development Manager to ensure a Quality Plan is developed. The plan, as a minimum, shall contain the following documents:

- The CB&I Global Quality Policy
- The CB&I Regional Quality Policy, if applicable
- Description of Quality activities within the project on how to execute and manage
- Listing of procedures required to execute the project

4.2 Quality Plans – Project

4.2.1 Project Quality Managers are responsible for the creation, maintenance, and implementation of PQPs. If a Quality Plan is developed during the pre-contract phase, it shall be utilized as the basis for the PQP.

4.2.2 Standardized PQPs for specific product lines may be utilized in lieu of generating project specific documents.

4.3 Structure

4.3.1 PQPs contain (or refer to) the following elements, as a minimum:

- The CB&I Global Quality Policy and/or CB&I Regional Quality Policy, if applicable
- Definition of Scope of Work covered by the project
- Quality Objectives and metrics to be used to monitor performance towards those objectives
- Organization and responsibilities for the execution of the scope
- Description of Quality activities within the project on how to execute and manage and associated CB&I Management System (CMS) documents, as applicable:

- Project Management
- Quality
- Project Controls
- Engineering
- Procurement
- Subcontracts
- Fabrication
- Construction
- Commissioning
- Document Control/Records Management

4.3.2 Additional functions may be added according to need of the project.

4.3.3 Major projects shall utilize the CMS-720-01-FM-00015 PQP Template and modify in accordance with the project specific requirements. However the content of the project quality plan shall include but not limited to the following:

- INTRODUCTION
- SCOPE
  - Scope and Purpose
  - Applicability
- DEFINITIONS
- CB&I QUALITY MANAGEMENT SYSTEM (CMS) OVERVIEW
- PROJECT QUALITY MANAGEMENT SYSTEM OVERVIEW
- MANAGEMENT RESPONSIBILLITY
- RESOURCE MANAGEMENT
  - Provision of resources
  - Human Resources
  - Infrastructure
  - Work environment
  - Project Organization and Responsibilities
- PROJECT REALIZATION
  - Planning
  - Customer-Related Processes
  - Design and Development
  - Estimating
  - Purchasing
  - Subcontracting
  - Fabrication
  - Construction
  - Commissioning
- MEASUREMENT, ANALYSIS, AND IMPROVEMENT
  - Monitoring and Measuring
  - Analysis of Data
  - Improvement

4.3.4 For small projects, including standard products, templates may be used and modified as needed to accurately list the small project requirements. A Project Quality Plan can be created for each standard product project by including a copy of the Standard Project Quality Plan. Forms which can be used as baseline templates for several standard product types are referenced in 5.0.

4.3.5 At the discretion of the Quality Manager, a specific PQP may be deemed unnecessary if not practical and/or not commercially viable in cases of short-term small projects

and/or standard products involving routine scopes of work such as tank maintenance, shut-down repairs, etc. In these cases, the pertinent CMS documents affecting product or service quality shall be identified using Inspection and Test Plans (ITP's).

4.3.6 A Project Procedures Manual report can be run from Project EDMS for a snap-shot of the applicable Issued for Use documents which have been applied to the project. The report generated will include both Primary and Secondary documents which have been loaded into the Folder 9 "Project Execution Plans and Procedures". This report will be considered an Attachment to the Project Quality Plan and is a live document.

4.4 Approval and Revision

4.4.1 Project Quality Plans shall be prepared by Project Quality Manager and approved by the Project Manager, as a minimum. Based on the contractual requirements, client approval might be required. Once approved, any further revisions to the Project Quality Plans can be approved by the Project Quality Manager, unless there are fundamental changes to the plan.

5.0 REFERENCES

ISO 10005	Quality Management – Guidelines for Quality Plans
CMS-720-00-PL-00010.0001	CB&I Global Quality Policy
CMS-720-01-PR-00290	Inspection and Test Plans
CMS-720-01-FM-00015	Major EPFC Type Project Quality Plans Template
CMS-720-01-FM-71001	SPS Standard Project Quality Plan
CMS-720-01-FM-71002	Project Quality Control Details - API 620
CMS-720-01-FM-71003	Project Quality Assurance Details - API 620
CMS-720-01-FM-71004	Project Quality Assurance Details - API 650
CMS-720-01-FM-71005	Project Quality Control Details - API 650
CMS-720-01-FM-71006	Project Quality Assurance Details - ASME Sec I,VIII, or NBIC
CMS-720-01-FM-71007	Project Quality Control Details - ASME Sec I,VIII, or NBIC
CMS-720-01-FM-71008	Project Quality Assurance Details - AWWA
CMS-720-01-FM-71009	Project Quality Control Details - AWWA
CMS-810-00-PR-00018	Archiving and Storage of Project Documents

6.0 TERMINOLOGY

None

7.0 EXHIBITS

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary

8.0 ATTACHMENT

None

PROCEDURE

Procedure Title:	**Receiving Inspection**	**CMS Number:**	**CMS-720-02-PR-00480**
Procedure Owner:	**Global Quality**	**Issuing Authority:**	**Director Global Quality**

RECEIVING INSPECTION

1	Issued for Use – Incorporated some approved comments from Global Review that did not transfer to document when accepting all comments in Track Changes. Majority of comments were captured. (See Rev Bars)	PDJ	28 Jun 2013
0	Issued for Use – Total Rewrite – This procedure Supersedes CMS-720-01-PR-00480, Deleted “Plate Structures” from the Title, Changed all CMS-720-01 referenced documents to CMS-720-02 with the exception of Business & Technical Glossaries and moved glossaries to 7.0 Exhibits. (No Rev Bars)	PDJ	10 Jun 2013
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure details the use of the following Receiving Inspection Reports (RIR) for receipt of plate, for non-plate items and for multiple plates.

1.1 Form CMS-720-02-FM-00480 Receiving Inspection Report (Plate): This form is used for plate receipt inspections (i.e., has a sketch of a plate for the recording of micrometer thickness readings). This document is used only for items ordered for a contract.

1.2 Form CMS-720-02-FM-00481 Receiving Inspection Report (Warehouse): This form is used for non-plate items. This form is used only for items ordered for a contract.

1.3 Form CMS-720-02-FM-00482 Receiving Inspection Report (Sample Multiple Plate Inspection): This form is utilized for plate receipt inspections. This document is used only for items ordered for a contract.

1.4 If stock or unassigned material is applied, then form CMS-720-02-FM-00520 Verification of "Unassigned" Material (see CMS-720-02-PR-00520) is used in accordance with procedure CMS-720-02-PR-00520 Plate Structures Verification of Unassigned Material.

2.0 SCOPE

This procedure applies to all personnel required to generate or process RIRs.

The use of RIR forms is required when specified by the standard Material Control Classification Requirements table (CMS-720-02-PR-00440) or project specific "S" Table, and when specified by Purchasing for Material ID Code "B".

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this procedure:

- Procurement Buyer
- Fabrication Shop Quality Manager
- Site (Project) Quality Manager
- Superintendent (Foreman)
- Project Manager/Construction Supervisor
- Shop/Site Quality Control (QC)
- Welding Manager

4.0 PROCEDURE

4.1 Procedure Steps

4.1.1 The Material ID Code defines which items require initiation of an RIR. The receiving requirements are specified by Material ID Codes recorded on requisitions (i.e., Bills, Shipping Order, etc.)

4.1.2 Shop QC or the Site (Project) Quality Manager will initiate RIRs as specified by Material ID Codes. When RIRs are required, one will be initiated for each item or each piece. For Multiple Plate Receipt Inspection, form CMS-720-02-FM-00482 Receiving Inspection Report is utilized.

4.1.3 Shop QC will print and distribute RIR's to Receiving along with any appropriate documents to assist Receiving.

4.1.4 RIRs should be initiated at the time orders are prepared and be available to Receiving when the material arrives. RIRs are sent to Receiving with a copy of the shipping notice, and any other documentation needed for receipt.

4.1.5 RIRs for direct shipments to a site plus a copy of this procedure will be sent to the Site (Project) Quality Manager or Superintendent (Foreman) through the Project Manager or the Project Quality Manager.

4.1.6 Manufacturing/ Construction Receiving will receive materials and items, and perform required inspection operation and complete the receiving portion of the RIR.

4.1.7 The Superintendent (Foreman) is responsible for completion of RIRs and assists Purchasing in resolving nonconformities.

4.1.8 RIRs, when they are printed or made, should contain the following:

- Contract number
- Order Number
- Item Number
- Supplier
- Quantity Ordered
- Material Specification
- Description
- Routing of Report, if applicable
- Report Initiated By and Date
- Any special receiving inspections to be performed on the item such as:
  - Measurements - when measurements beyond the normal checks of length and width for plates, length and nominal diameter for piping, or nominal diameter for forgings is required.
  - Thickness - when special measurements are required to determine the actual backing and/or cladding thickness of composite materials in lieu of the normal check of the composite thickness.

4.1.9 For Material ID Code "B" Materials, Purchasing determines the need for spot (10%) inspections. If spot inspections are required, Purchasing will notify the receiving location of the material requiring inspection. Form CMS-720-02-FM-00480 or CMS-720-02-FM-00481 is initiated at the location for those items requiring inspection.

4.1.10 For all material and items received, where an RIR has been initiated, the receiving location record all applicable information requested under "Receiving Inspection". All information is taken directly from the actual material or items received.

4.1.11 The receiving location records the following information:

- Quantity received and inspected
- Whether shipment is partial or complete
- Material specification (as it is marked on the material by the supplier or manufacturer)
- Supplier identification numbers (heat, slab, lot, plate identifier, serial, etc. marked on the material by the supplier or manufacturer)
- For plate, required thickness readings (see paragraph 4.2)
- Whether dimensions agree with Order, Sketch or Drawing
- Show identification number of micrometer or digital thickness gage used. If none used, complete blank with "N/A"
- Indicate whether material received is acceptable or unacceptable
- If it is unacceptable, explain why
- Indicate whether the material has been tagged or marked “Hold” or segregated
- Show by whom the inspection was completed and when the material or items was received

4.1.12 Receiving will return all completed RIRs to the Shop or Site QC as soon as the material or items are unloaded and checked.

4.1.13 Shop or Site QC will verify the information on RIRs reported by Receiving, complies with the requirements of the purchase order and Material Verification Summary Sheet (MVSS) as each RIR is returned.

4.1.14 A sequential number is assigned to the RIR and marked on the RIR in the lower right hand corner.

4.1.15 The MVSS will be marked to indicate the check has been made and the RIR series number recorded.

Note: Verifying an RIR means they have been checked to determine the reported information complies with the requirements of the purchase order and any referenced specifications (i.e., markings, dimensions (e.g., for plate the correct length, width and thickness), etc.). The markings shall be complete and traceable to the MTR, the length and width dimensions are minimums (i.e., a trim allowance has been added so as to be able to fabricate an item) unless noted otherwise, and the thickness is within both the minimum and maximum allowable specification tolerance.

4.1.16 When a partial shipment of items is received, and individual RIRs are not issued, the Shop or Site QC representative is responsible for initiating additional RIRs to cover the unshipped balance.

4.1.17 Shop or Site QC will check the supplier's documentation (Material Test Reports (MTRs), Certificates of Conformance (COCs), NDE and test reports, etc.) and if acceptable, releases the material or item for use by initialing and dating the "Material Released for Fabrication" block on the RIR Form and sending a copy to Receiving. The completed RIR shall be filed in the project EDMS.

4.1.18 Note: The EDMS may also be used to manage the progress of the RIR from initiation to completion.

4.1.19 Shop or Site QC will review RIR's completed by Receiving and will release material for use or coordinate resolution of nonconformities.

4.1.20 If any nonconformities exist and a decision has been made not to return the material or item to the supplier or a decision is made to scrap it, Shop or Site QC shall complete the "Description" block of the NONCONFORMITIES section of the RIR. The RIR is initialized, dated and forwarded to the Welding Manager & Quality Manager.

4.1.21 Upon receipt, the Welding Manager & Quality Manager, as applicable, completes the "Disposition" block of the RIR. The RIR is initialized and dated, and a copy is forwarded to Purchasing.

4.1.21.1 The Quality Manager initiates the disposition and once the disposition has been completed, the Quality Manager initials and dates the "Disposition Completed" block of the RIR.

4.1.21.2 For positive dispositions, the Quality Manager releases the material or item for use by initialing and dating the "Material Released for Fabrication" block and a copy is forwarded to Receiving and Purchasing.

4.1.21.3 For negative dispositions, the Quality Manager shall mark or stamp in the bottom right corner "Unacceptable for Use". The RIR is initialed and dated and a copy is forwarded to Purchasing, Shop QC, Site QC and Receiving.

4.1.21.4 Purchasing is responsible for the disposition of the material or item.

4.1.22 If nonconforming material or items were found as a result of a spot check, Shop or Site QC and their Quality Manager shall give consideration to checking other similar material or items depending upon the nature of the nonconformity.

4.1.23 When heat treating or nondestructive examination is part of the material specification, and it is to be performed by CB&I, the material will be nonconforming when received. Purchasing shall indicate in the "Description" block of the NONCONFORMATIES section, when the RIR is initiated, what action is required by CB&I before the material can be considered as conforming to the material specification. After receipt, the material is handled per above.

4.1.24 By checking against the entries on the MVSS, Shop or Site QC will ensure the RIRs are returned from Receiving as material is received. Where nonconformities exist, the Quality Manager verifies the copies have been returned and the dispositions have been completed.

4.1.25 Shop QC files the RIR by contract in numerical order. For nonconforming material, the RIR is filed only after the Quality Manager has returned a copy indicating the disposition has been completed

4.2 General Receiving Instructions

4.2.1 Plate shall be gauged at each corner and at the midpoint of each long side. Readings shall be taken at 3/8 in. (9mm) to 3/4 in. (19mm) from the plate's edge. When a single RIR is utilized to receive more than one plate, plates with identical JDE item numbers shall be documented. Micrometer readings shall be traceable to the individual plates. See CMS-720-02-FM-00482 for an example.

Note: Micrometers and digital thickness gages shall be calibrated in accordance with the Corporate Calibration Program.

Note: For roofs and suspended decks & outer bottoms of non-double integrity LT&C plate structures, the use of a micrometer/digital thickness gage is not mandatory for all plates. Only the top plate, from one of the bundles, for each piece mark need be checked with a micrometer/digital thickness gage; the remaining plates need only be confirmed with a tape or ruler. Document tape or ruler checks within the picture of the plate on the CMS-720-02-FM-00480 form.

4.2.2 A plate is normally acceptable as far as permissible variation under specified thickness is concerned if it does not under run the ordered thickness by more than 0.014 in (0.34mm). If the under run is more, it shall be reported by Receiving to Purchasing as a nonconformity.

4.2.3 Purchasing shall determine with Engineering whether the plate is useable. For plates with localized areas of under run where allowances have been made for shop or site fabrication, Purchasing, in conjunction with the shop or site, shall determine whether the plate is useable*.

Note: Useable - means the localized area of thinning is located in the drop-off (e.g., scrap) material portions of the plate or that the item to be cut from the plate can be positioned so that the localized thin area is drop-off. If fabricated items require special positioning, due to the above, controls shall be put in place to ensure the area(s) of local thinning will not be used.

4.2.4 Acceptable width and length will depend on various conditions such as the application, allowances made for shop or site fabrication and permissible mill variations. Any variation on the minus side from the ordered width or length shall be reported by Receiving to Purchasing as a nonconformity. Purchasing, in conjunction with the shop or site, shall determine whether the plate is useable.

Note: Useable - means the item to be fabricated can still be properly fabricated from the undersized plate.

4.2.5 The surface of material and items, top surface of all plates, when received, shall be inspected for defects such as laminations, gouges, scabs, pits, etc. Surface defects reported by Receiving shall be cleared by Purchasing with the Quality Manager before the material is released.

4.2.6 Material or items that require special weather protection, such as aluminum, 9% Ni, etc., shall be inspected and then stored appropriately after receipt.

4.2.7 Structural items requiring identification that is not individually marked by the supplier with the supplier's material identification number must be individually marked when received or when the bundle is broken and material is issued for use.

4.3 Conditional Release

4.3.1 When requested by the Project Manager (PM) or his delegate, material or items requiring MTRs or COCs with incorrect or missing documentation may be conditionally released for fabrication by Shop or Site QC.

4.3.2 For material or items to be conditionally released, the received material or item must be confirmed (via the RIR) as being of the correct size and shape and must be adequately marked so that it can be properly identified.

4.3.3 Shop or Site QC shall mark or stamp a copy of the RIR in the bottom right corner "Material Conditionally Released" and initial and date the statement. Copies shall be filed in the project EDMS and distributed to Receiving and to the Quality Manager.

4.3.4 The Quality Manager shall establish procedures to maintain traceability of the material or item so that in the event of a nonconformity, it can be located and held for disposition. No conditionally released material shall be shipped to the Site or Client without the proper transfer of authority to control the conditional release until it is resolved.

4.3.5 When proper documentation is received from the supplier and found to be acceptable by Shop or Site QC, the original RIR shall be released and copies of the RIR shall be filed in the project EDMS and distributed to Receiving and the Quality Manager.

4.3.6 When missing or corrected documentation is not received from the supplier, the material or item is then considered nonconforming and shall be handled as per above.

4.4 Nonconforming Release

4.4.1 When requested by the PM or his delegate, nonconforming material or items may be released for fabrication by the Quality Manager if it is determined that the nonconformity will be favorably resolved and that it does not affect any of the necessary fabrication processes.

4.4.2 The Quality Manager shall mark or stamp a copy of the RIR in the bottom right corner "Material Released Nonconforming", initial and date the statement and forward copies to Receiving and to Purchasing.

4.4.3 The Quality Manager shall establish procedures to maintain traceability of the material or item so that in the event the nonconformity cannot be positively resolved, the material can be located and removed. Nonconforming materials or items shall not be shipped to the Site or Client without the proper transfer of authority to control the nonconforming release until it is resolved. The Quality Manager ensures nonconformities have been resolved and shall assist the Superintendent (Foreman) with receiving functions.

5.0 REFERENCES

CMS-720-02-PR-00420	Plate Structures Detail Material ID Code
CMS-720-02-PR-00520	Plate Structures Verification of Unassigned Material
CMS-720-02-FM-00480	Receiving Inspection Report (Plate)
CMS-720-02-FM-00481	Receiving Inspection Report (Warehouse)
CMS-720-02-FM-00482	Receiving Inspection Report (Sample Multiple Plate Inspection)
CMS-720-02-FM-00520	Verification of “Unassigned” Material

6.0 TERMINOLOGY

Term	***Definition***
Receiving	Any location where receiving of materials or items takes place

(Shop, Site, Supplier, etc.)

7.0 EXHIBITS

Exhibit 7.1 CMS-720-01-FM-00020 – Business Glossary

Exhibit 7.2 CMS-720-01-FM-00021 – Technical Glossary

8.0 ATTACHMENTS

None

PROCEDURE

Procedure Title:	**CONSTRUCTION INSPECTION PROGRAM**	**CMS Number:**	**CMS-720-01-PR-00230**
Procedure Owner:	**Corporate Quality**	**Issuing Authority:**	**Director Global Quality**

CONSTRUCTION INSPECTION PROGRAM

1	Issued for Use – Total re-write. (No Rev Bars)	PDJ	19 Aug 2013
0	Issued for Use	DLK	18 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure describes the inspection activities used by CB&I Construction Quality Management to ensure the effectiveness of quality control and technical compliance of subcontracted and self-perform work and to identify systemic weaknesses in the Construction, Installation, Commissioning, and Subcontractor activities.

2.0 SCOPE

This procedure covers all site construction inspection activities performed by CBI or its subcontractors. Inspection activities include:

- Specific pre-determined inspection Hold, Witness, Review, and Surveillance points that are identified on Inspection and Test Plans (ITP's) against specific stage inspection/test activities,
- QC surveillance activities that are not identified specifically on ITPs.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this procedure:

- CB&I Quality Manager [QM]
- CBI Construction Management [CCM] (Self Perform)
- CB&I Inspectors
- Sub-Contractors

4.0 PROCEDURE

4.1 Inspection & Test Plans (ITP)

Prior to the start of Construction activities, QM will either prepare detailed ITP's (for self-perform work) or have subcontractors prepare ITP for their scope of work.

Refer to CMS-720-01-PR-0029 Inspection and Test Plans (ITP) for further information.

4.2 Notification of Inspection (NOI)

QM will instigate a process of inspection notification to be used by CBI Construction Management and Subcontractor Quality to notify QM when those inspection points identified as Hold, Witness, and Review points on ITP have been reached. CBI Construction Management and Subcontractor QC, as applicable, will perform and verify acceptance of the inspection before issuing the Notification of Inspection to QM.

4.3 Extent of Inspection

4.3.1 Hold Points

Minimum 100% coverage required. Any deviation to this requirement is to be made on a case by case basis by QM. Should circumstances or experience indicate that a Hold point is unnecessary, ITP should be revised accordingly.

4.3.2 Witness Points

Minimum 100%; however, with the approval of QM this may be reduced to a minimum of 80%.

4.3.3 Review Points

Minimum 100% required.

When the Review is coupled with HOLD or WITNESS Point the inspector will add the word 'Witnessed' by his signature. When the activity is not witnessed, the inspector shall add the words 'reviewed only' by his signature.

4.3.4 Surveillance Points

The surveillance points indicated on ITP can be considered as 'Planned" surveillance points.

These surveillance points will be covered initially on the commencement of the work covered by the ITP and, thereafter, at the direction of QM until the work covered by that ITP is complete. The frequency and extent of the surveillance activities will be at the discretion of CB&I Quality Manager and shall be defined or referenced in the Project Quality Plan.

In order to record the results of the surveillance activities, Inspectors utilize the CMS-720-01-FM-00230 Quality Surveillance Report.

Note: These 'Planned' surveillance activities are in addition to the normal monitoring activities undertaken by inspection personnel during their time in the field. There is no requirement to document "normal" monitoring activities unless problems are identified, in which case the QM will decide upon the method of reporting on a case by case basis.

4.4 Deficiencies

Identified deficiencies to specified requirement as a result of an inspection activity (H, W, and R), shall be handled as follows;

- In process Inspection (W and R) – Deficiencies are recorded on the NOI for correction.
- For an item that does not comply with the specification, drawing, code, etc., that cannot be corrected during the normal course of fabrication / erection or has a major cost associated with it, an NCR should be raised in accordance with CMS-720-01-PR-00150 Identification, Control, and Disposition of Nonconforming Product Procedure.
- Final Inspection (H) – add to a punch list

4.5 Recording Results of Inspections

4.5.1 The results of Hold, Witness, and Review points are recorded on Inspection & Test Reports/Checklists, as identified in the Recording Document column of the ITP. These documents then form part of the QC Documentation Package becomes part of the System Turnover records.

4.5.2 Planned surveillance activities will be reported on the 720-01-FM-00230 Quality Surveillance Report.

4.6 Monitoring Results of Inspections

4.6.1 At the discretion of CB&I Quality Manager, inspection and surveillance results will be monitored by the CMS-720-01-FM-00231 Inspection Monitoring Form. The parameters defined in the monitoring form can be suited for project needs and scope.

4.6.2 A range of Reports may be generated from the CMS-720-01-FM-00231 Inspection Monitoring Form. A weekly and/or monthly report will be issued to CBI Construction Quality Management.

4.6.3 The CMS-720-01-FM-00231 Inspection Monitoring Form and the NOIs will be maintained in related EDMS folder together with ITPs.

4.7 Guidelines for CB&I Inspector Site Surveillance and Monitoring Activities

4.7.1 Surveillance activities can be classed as either 'Planned' or 'Unplanned' (random).

4.7.2 The guidelines that are equally valid for Planned and Unplanned surveillance activities have been detailed in CMS-720-01-GL-00230 Guidelines for Quality Surveillance Activities.

5.0 REFERENCES

CMS-720-01-PR-00290	Inspection and Test Plans (ITPs)
CMS-720-01-PR-00150	Identification, Control and Disposition of Nonconforming Product
CMS-720-01-GL-00230	Guidelines for Quality Surveillance Activities
CMS-720-01-FM-00230	Quality Surveillance Report
CMS-720-01-FM-00231	Inspection Monitoring

6.0 TERMINOLOGY

Term	***Definition***
CBI Quality Manager (QM)	The Project Quality Manager or Site QA/QC Manager, or their delegates.
Inspection Hold Point (H)	A **Hold Point** is established by an interested party when they require being present for a particular inspection and/or test activity or when continued work may not take place until released by the interested party. This Hold is documented by sign-off on the Recording Document. Unless otherwise specified, work may not proceed beyond the Hold Point unless release is given in writing by the party establishing the Hold Point. Hold Points are indicated on an ITP with an 'H'.
Inspection Review Point (R)	A **Review Point** is established by an interested party for a particular activity when they desire to review the documented results for that activity. This review is documented by sign-off on the Recording Document. Review Points are indicated on an ITP with an 'R'.
Inspection Surveillance Point (S)	A **Surveillance Point** is established by an interested party for a particular activity which they will monitor periodically. Surveillance shall be documented by sign-off on the Recording Document when the interested party is present during the activity. Surveillance Points are indicated on an ITP with an 'S'. Surveillance Points that are specifically assigned to activities on an ITP can be considered **'Planned'** Surveillances and, since there will often be no Recording Document for a Surveillance Point, they will be documented on the Quality Surveillance Report.
Inspection Witness Point (W)	A **Witness Point** is established by an interested party when they request to be present for a particular activity. This witness shall be documented by sign-off on the Recording Document when the interested party is present during the activity. Unless otherwise specified, an activity with a Witness Point may proceed, without the presence of the party establishing the Witness Point, providing the required documented notification was made.
Quality Surveillance Report	Report on which the results of "planned" quality surveillances are recorded.

Notification of Inspection (NOI)	The written advice to CBI Quality Management that a Hold, Witness or Review Point on an ITP is ready for their inspection. The format of the NOI shall be established by the CB&I Site Quality Manager.
Inspection Monitoring Form	The Form used to log and monitor the results of the planned quality Inspection and Surveillance activities.
Unplanned Surveillance Activities	The following terms are used interchangeably in this procedure; random/periodic surveillance and monitoring. These activities performed by CB&I inspectors are not identified with an 'S' on the ITP (i.e., not 'Planned' surveillance activities).

7.0 EXHIBITS

Exhibit 7.1	CMS-720-01-FM-00020 – Business Glossary
Exhibit 7.2	CMS-720-01-FM-00021 – Technical Glossary

8.0 ATTACHMENTS

None

PROCEDURE

Procedure Title:	Inspection and Test Plans (ITP)	CMS Number:	CMS-720-01-PR-00290
Procedure Owner:	Global Quality	Issuing Authority:	Director Global Quality

INSPECTION AND TEST PLANS (ITP)

Rev	Changes	Approved	Date
7	Issued for Use – Moved ITPs from 8.0 Attachments to 5.0 References, No change to content, Issuing Authority approval not required. (No Rev Bars)	BDR	01 Aug 2013
6	Issued for Use - Added reference to ITP Forms as a parent document. Added missing reference procedures. Added new planned WP.	HS	07 May 2013
5	Issued for Use – Major rewrite – No Revision Bars	PDJ	04 Jan 2013
4	Issued for Use – Incorporated consistency review comments (grammatical), Issuing Authority approval not required. (No Rev Bars)	BDR	25 Aug 2009
0	Originally Approved Issued for Use 17 Jul 2008	DLK	17 Jul 2008

1.0 PURPOSE

This procedure establishes the method for developing Inspection and Test Plans (ITP) within CB&I including inspection requirements, third party involvement and procedures to verify the quality of work, services and materials. This document also describes the process for requesting, reviewing and approving of supplier and subcontractor ITPs.

2.0 SCOPE

This procedure applies to Quality, Construction, Fabrication, Procurement, Project Management and Engineering within CB&I. It is important to note, when CB&I is the contractor, CB&I staff develop the ITPs for CB&I's scope of work. Suppliers and subcontractors develop ITPs for their scope of work with CB&I staff reviewing and approving the plans.

3.0 RESPONSIBILITIES

The following functions have responsibilities defined in this procedure:

- Fabrication
- Quality
- Construction
- Project Management
- Engineering
- Procurement
- Subcontracts

4.0 PROCEDURE

4.1 General – For Self Performed Work

4.1.1 Fabrication Shop Quality Managers are responsible for development of the ITP providing the required activities, tests, acceptance criteria and recording documents as well as distribution within the Fabrication Shop for review.

4.1.2 Construction Quality Managers are responsible for ensuring the initial development of the ITP, providing required activities, tests, acceptance criteria, and recording documents as well as distribution within Construction Management for review.

4.1.3 Project Quality Managers are responsible for ensuring the ITP development is performed by Shop and Construction Quality Managers and that the contents are agreed with Fabrication/Construction Management and where necessary, approved by the Client.

4.1.4 Fabrication Shop and Construction personnel including Quality Control (QC) and Project Management personnel are responsible for executing the various elements of the ITP.

4.2 General – For Supplier and Subcontractor Activities

The supplier or subcontractor is responsible for creating the Inspection & Test Plan based upon CB&I derived inspection requirements. Supplier related inspection activities and requirements are referenced in CMS-760-04-PR-21000, Source Inspection Coordination and Execution. Subcontractor inspection and testing requirements are included in the Subcontract.

4.3 General - Overall

4.3.1 An Inspection & Test Plan (ITP) shall identify the inspection requirements, customer and third party involvement and procedures to produce and verify the quality of work, services, and materials.

4.3.2 The ITP shall encompass, as appropriate, all manufacturing, fabrication, inspection & testing to be implemented during the execution of the Scope of Work referenced in the client contract or Purchase Order (P.O.)

4.3.3 All planned inspection and testing activities by CB&I, the client and other parties shall be listed in the ITP. Individual discipline specific ITPs shall be prepared for projects involving multiple disciplines such as civil, tankage, piping, electrical & instrumentation, etc. based on the scope of work. The inspection and testing activities shall be listed in a sequential order. More than one activity may progress simultaneously.

4.3.4 All project quality / certification requirements shall be listed in the ITP. This includes code, client, and CB&I internal requirements.

4.3.5 CMS ITP Templates are given in Attachment.

4.4 Inspection Points

4.4.1 Inspection points (Hold/ Witness/ Review/ Surveillance) may be designated by the client, jurisdictional authority, or assigned by the Project Inspection Coordinator (for suppliers), or the Quality Representative directly responsible for inspection of the work (for CB&I Self Performed and Subcontractors) depending on project or code requirements.

4.4.2 An **Inspection Hold Point** is established by an interested party when they require being present for a particular activity or when continued work may not take place until released by the interested party. This hold is documented by sign-off on the Recording Document. Unless otherwise specified, work may not proceed beyond the Hold Point unless release is given in writing by the party establishing the Hold Point. Typical Inspection Hold Points may include the following:

- Pre-inspection meetings with suppliers
- Receiving inspection of plant materials
- First welds
- Hydrostatic/Pneumatic Testing
- Overload Test
- Factory acceptance tests

4.4.3 An **Inspection Witness Point** is established by an interested party when they request to be present for a particular activity. This witness shall be documented by sign-off on the Recording Document when the interested party is present during the activity. Unless otherwise specified, an activity with a Witness Point may proceed, without the presence of the party establishing the Witness Point, providing the required documented notification was made. Typical Inspection Witness Points may include the following:

- Orientation of valve operators
- Continuity checks of circuits
- Weld Joint Fit-Up
- Performance Testing
- Mechanical Run Testing

4.4.4 An **Inspection Review Point** is established by an interested party for a particular activity when they desire to review the documented results for that activity. This review is documented by sign-off on the Recording Document.

4.4.5 An **Inspection Surveillance Point** is established by an interested party for a particular activity which they will monitor periodically. Surveillance shall be documented by sign-off on the Recording Document when the interested party is present during the activity.

4.4.6 Client Inspection Hold and Witness Points shall be scheduled in writing with the client by CB&I to prevent any misunderstandings.

Note: In the event the above listed definitions (4.4.2 – 4.4.5) are inconsistent with the applicable fabrication code/ standard governing the work, the code/ standard will take precedence.

4.5 ITP Format & Information Required

4.5.1 The terminology and format for an ITP is shown as an example in CMS-720-01-FM-00290 and CMS-720-01-FM-00291. This format shall be used within CB&I, and may be used by a supplier or subcontractor, as applicable. The supplier or subcontractor may adopt an alternative format which includes the same level of information, as applicable to the type of material/ equipment provided. Note: additional information may be added to this format without the necessity for a Deviation Request.

4.5.2 Information to be included in the ITP whether to be used within CB&I or with a supplier/subcontractor are as follows:

Column	ITP Information Fields	Description of Fields
1	Activity No.	Indicates the activity or task number.
2	Activity Description	Indicates the associated quality inspection and/or test activity, or activities to be carried out. The extent of the description must be sufficient to show every quality inspection verification activity undertaken within CB&I or by the supplier/subcontractor during the production of the applicable equipment, material, fabrication or service. Suppliers are responsible for determining ITP activities particular to their Scope of Work; however, CB&I may choose to insert any additional activities which may be considered necessary.
3	Controlling Document	Indicates the identification of the control procedures, or work instruction references governing the quality of the work. This includes procedures for the control of special processes requiring acceptance/ approval by CB&I or the client prior to use.
4	Responsible Party	Identifies the party responsible for execution of the activity and/ or acceptance of the results. This may be Construction, QC, etc.
5	Acceptance Criteria	Indicates either the Acceptance criteria or the procedure containing the acceptance criteria pertaining to the activity. Note: References to applicable project specifications, codes and standards should be included where applicable.
6	Recording Document	Indicates the verification documents providing confirmation of satisfactory completion of the task i.e. NDE Reports, Pressure Test Records, etc.
7	Inspection Involvement – CB&I	Indicates the level of inspection involvement (Hold, Witness, Review, and Surveillance) by CB&I Personnel or CB&I Subcontracted Personnel.
8	Inspection Involvement – QC	Indicates the level of inspection involvement (Hold, Witness, Review, and Surveillance) by Quality Control Personnel.
9	Inspection	Indicates the level of inspection involvement (Hold, Witness, Review, and

	Involvement - Client	Surveillance) by the client.
10	Inspection Involvement – Third Party	Indicates those activities which will be subject to inspection (Hold, Witness, Review, Surveillance) by a third party organization such as an Authorized Inspector, etc.

4.6 Supplier ITP Submission and Reviews

4.6.1 As indicated in the Engineering procedure, Requisitioning and Technical Bid Analysis, CMS-830-00-PR-02040, the Requisitioning Engineer, once the engineering technical requirements are defined, is responsible for providing the preliminary package to the Project Inspector Coordinator.

4.6.2 The Project Inspection Coordinator, in accordance with CMS-760-04-PR-21000, prepares an Inspection Requirements Form (IRF), CMS-760-04-FM-21002. An IRF shall be completed for each Material Requisition for Quotation (MRQ), these documents shall be provided to the supplier as a package.

4.6.3 The Project Inspection Coordinator shall include and clearly identify in the Inspection Requirements Form any specific engineering requirements for witnessed inspections.

4.6.4 After the supplier receives the MRQ, the supplier shall review, clarify and bid on the MRQ and provide the necessary feedback to the CB&I MRQ Originator.

4.6.5 After the Purchase Order (P.O.) has been issued to the supplier, the supplier shall create a detailed ITP, as required, in an agreed upon format after receipt of a P.O./Contract from CB&I.

4.6.6 Supplier originated ITP's are submitted to CB&I no later than the date / time frame specified in the P.O./Contract.

4.6.7 Supplier ITPs will be reviewed by the Project Inspection Coordinator, the Requisitioning Engineer and the client, as applicable. Consolidated review comments/ approvals will be returned to the supplier in accordance with the Project document control procedures specified in the P.O. Supplier ITPs may be agreed and finalized during the Pre-inspection Meeting.

4.6.8 For supplier or sub-supplier activities, the supplier or sub-supplier ITPs are approved by the Requisitioning Engineer after review by the Project Inspection Coordinator and client, as applicable.

4.7 Major Sub-Supplier ITP Requirements

4.7.1 The determination of whether an ITP is required for a sub supplier is the responsibility of the Project Inspection Coordinator with input from the Requisitioning Engineer and supplier. Individual ITP's may be required for major sub-suppliers performing manufacturing or fabrication work for the supplier. A partial listing is provided below for guidance:

- Castings / Forgings
- Electric Motors / Drivers Low Voltage 200HP (150 kW) and above, and all medium Voltage motors
- Control Panels
- Pumps
- Gear Units
- Fans / Blowers
- Burners
- Pressure Vessels / Heat Exchangers

- Fabricated Piping
- Fabricated Structural Steel, i.e. skids, bases, platforms, ladders, etc.
- Critical service components, i.e. items in cryogenic service, etc.
- Major valves required for safe shutdown of the facility including cryogenic valves

4.8 Subcontractor ITP Submission, Review and Approval

4.8.1 Subcontracts shall include requirements for the subcontractor to develop project specific ITPs in accordance with the inspection and test requirements of the project.

4.8.2 Subcontractors shall submit the ITPs in accordance with the subcontract for review and approval of CB&I. Expectations for the ITPs and project requirements shall be reviewed and discussed in the Kick-Off Meeting with the Subcontractor.

4.8.3 Subcontractor ITPs shall be reviewed by CB&I for completeness and accuracy against project, code and CMS requirements. CB&I Project Quality Manager or designee is responsible for the review of ITPs along with input from Engineering and Construction/Fabrication, as applicable. The CB&I Project Quality Manager or designee shall collate all comments, including any from the Client, and return the ITP with the comments to the subcontractor.

4.8.4 When all comments have been satisfactorily addressed by the subcontractor and the ITP revised and resubmitted accordingly, the CB&I Project Quality Manager or designee shall approve the ITP

4.8.5 Subcontractor ITPs should be approved prior to the Pre-Inspection Meeting, where applicable and shall be approved prior to the start of any associated work.

4.9 Review and Approval

4.9.1 For self perform work, after the ITP is completed, the ITP shall be reviewed for approval by the Project Quality Manager or designee.

4.9.2 If necessary, the Project Manager, or designee, shall forward the ITP to the client and to the jurisdictional authorities for input regarding inspection involvement.

4.9.3 If client or jurisdictional authority comments are received, the ITP shall be revised and updated by the Project Quality Manager or designee. The Project Manager, or designee, shall send an updated ITP to the client and jurisdictional authority for final approval.

4.9.4 Supplier or sub-supplier SITPs will be returned to the supplier or sub-supplier for incorporation of CB&I comments.

4.10 Inspection

4.10.1 Timely notification of an Inspection Point shall be made to the party who established the inspection involvement, as agreed on the approved ITP.

4.10.2 Results of an Inspection point shall be documented. If no issue exists, the appropriate recording document is completed and the process proceeds to the next inspection point.

4.10.3 If an issue is identified during in-process inspection, it is documented as part of the recording document. The issue may be mitigated per the provisions of an existing approved procedure and re-inspected for acceptance.

4.10.4 If an issue is identified after final acceptance, it is considered a non-conformance and shall be handled in accordance with CMS-720-01-PR-00150 “Identification, Control and Disposition of Nonconforming Product”.

4.10.5 Inspection at supplier facilities will be in accordance with CMS-760-04-PR-21000, Source Inspection Coordination and Execution.

5.0 REFERENCES

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary
CMS-720-01-WP-00230	Construction Inspection Program
CMS-720-01-PR-00150	Identification, Control and Disposition of Nonconforming Products
CMS-720-01-PR-00230	Construction Inspection Program
CMS-720-01-PR-00270	Management of Quality Records and Data
CMS-720-01-FM-00290	Inspection and Test Plan Cover
CMS-720-01-FM-00291	Inspection and Test Plan Details
CMS-720-02-FM-11501	ITP - Site Survey
CMS-720-02-FM-11502	ITP - SITE Preparation Works
CMS-720-02-FM-11503	ITP - Installation of Perimeter Fencing
CMS-720-02-FM-11504	ITP - Installation of Foundation Piles
CMS-720-02-FM-11505	ITP - Earthworks
CMS-720-02-FM-11506	ITP - Concrete Works
CMS-720-02-FM-11507	ITP - Installation of Underground Piping
CMS-720-02-FM-11508	ITP - Roads, Paving and Landscaping
CMS-720-02-FM-11509	ITP - Installation of Building & HVAC Systems
CMS-720-02-FM-11510	ITP - Installation of Fireproofing Materials
CMS-720-02-FM-11511	ITP - Steel Structural Prefabrication
CMS-720-02-FM-11512	ITP - Installation of Structural Steel
CMS-720-02-FM-11513	ITP - Installation of Static Equipment
CMS-720-02-FM-11514	ITP - Installation of Rotating Equipment
CMS-720-02-FM-11515	ITP - Installation of Storage Tanks
CMS-720-02-FM-11516	ITP - Installation of Storage Spheres
CMS-720-02-FM-11517	ITP - Installation of Fired Heaters
CMS-720-02-FM-11518	ITP - Piping Prefabrication
CMS-720-02-FM-11519	ITP - Installation of piping Systems
CMS-720-02-FM-11520	ITP - Installation of Grout
CMS-720-02-FM-11521	ITP - Installation of Electrical Systems
CMS-720-02-FM-11522	ITP - Installation of Instrumentation
CMS-720-02-FM-11523	ITP - Painting Works
CMS-720-02-FM-11524	ITP - Installation of Insulation

CMS-720-02-FM-11525	ITP - Installation of Package Units
CMS-720-02-FM-11526	ITP - Installation of Safety Equipment
CMS-720-02-FM-11527	ITP - Installation of Telecommunication Systems
CMS-720-02-FM-11528	ITP - Installation of Special Equipment
CMS-760-04-PR-21000	Source Inspection Coordination and Execution
CMS-810-00-PR-00018	Archiving and Storage of Project Documents
CMS-830-00-PR-02040	Requisitioning and Technical Bid Analysis

6.0 TERMINOLOGY

Term	***Definition***
Inspection Hold Point (H)	A **Hold Point** is established by an interested party when they require being present for a particular inspection and/or test activity or when continued work may not take place until released by the interested party. This hold is documented by sign-off on the Recording Document. Unless otherwise specified, work may not proceed beyond the Hold Point unless release is given in writing by the party establishing the Hold Point.
Inspection Witness Point (W)	A **Witness Point** is established by an interested party when they request to be present for a particular activity. This witness shall be documented by sign-off on the Recording Document when the interested party is present during the activity. Unless otherwise specified, an activity with a Witness Point may proceed, without the presence of the party establishing the Witness Point, providing the required documented notification was made.
Inspection Review Point (R)	A **Review Point** is established by an interested party for a particular activity when they desire to review the documented results for that activity. This review is documented by sign-off on the Recording Document.
Inspection Surveillance Point (S)	A **Surveillance Point** is established by an interested party for a particular activity which they will monitor periodically. Surveillance shall be documented by sign-off on the Recording Document when the interested party is present during the activity..

7.0 EXHIBITS

None

8.0 ATTACHMENTS

None

Guideline Title:	**GUIDELINES FOR QUALITY SURVEILLANCE ACTIVITIES**	**CMS Number:**	**CMS-720-01-GL-00230**
Guideline Owner:	**Corporate Quality**	**Issuing Authority:**	**Director Global Quality**

GUIDELINES FOR QUALITY SURVEILLANCE ACTIVITIES

0	Issued for Use	PDJ	19 Aug 2013
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This guideline describes the surveillance activities performed by CB&I Quality Inspectors on site to check the effectiveness of quality control and technical compliance of subcontracted and self-perform work.

2.0 SCOPE

This procedure covers all site construction inspection activities performed by CBI or its subcontractors. Surveillance activities include:

- Surveillance points that are identified on Inspection and Test Plans (ITP's) against specific stage inspection / test activities
- QC surveillance activities that are not identified specifically on ITPs

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this guideline:

- CB&I Inspectors

4.0 GUIDELINE

Surveillance activities can be classed as either 'Planned' or 'Unplanned' (random).

The guidelines that are equally valid for Planned and Unplanned surveillance activities have been detailed as follows:

4.1 Material Control and Traceability

Construction site control of materials (including subcontractors) are monitored via routine surveillance of materials activities, verification of materials by reviewing material certificates, and witnessing of material testing, where practical.

4.2 Material Receipt & Storage

4.2.1 The Construction site receiving practices (including subcontractors) are monitored to assure receipt of material is properly recorded and any deficiencies reported. The storage of materials is monitored to assure they are stored safely in a manner which prevents damage and are segregated from other non-project materials. Special attention is directed to segregation of various grades of materials.

4.2.2 Receipt of tagged items is monitored in the manner described above and verified assuring adequate protection against damage, corrosion and ingress of dirt or water.

4.3 Material Traceability

Materials are monitored daily as part of this program to assure compliance with requirements. The following are also reviewed, when required by the contract:

- Structural steel and piping materials traceable to material certificates;
- Welding consumables traceable to test certificates;
- Cables traceable to a batch number and drum through the cable schedule and pulling slips;
- Tagged equipment traceable through registers, indexes and record drawings;
- Structural and piping components are sampled to assure they can be traced from the fabrication drawings to the materials certificates;
- The control of off-cuts (drop material) is also monitored, and maintains traceability to the material certificate when applicable.
- Material preservation.

4.4 Welding (Structural and Piping)

4.4.1 The Construction site welding activities (including subcontractor activities) are monitored through the verification of welder qualifications, welder history logs, welding monitoring, and verification of welding parameters. These activities are carried out on a random basis as established in this program.

4.4.2 Surveillance activities for welding are implemented on random basis and cover all activities from qualification of welding procedures to completion of the welding log(s). Planned surveillance is provided in the ITP for following topics:

4.4.2.1 Welding Procedure Qualification

Where applicable, tests carried out to verify a welding procedure, to validate the fracture toughness or corrosion resistance of a material or a consumable are monitored. The subsequent NDE/ Inspection and mechanical or corrosion testing of samples may also be witnessed.

4.4.2.2 Welder Qualification

Welders shall be qualified to work with the welding process and positions they shall utilize on the work.

Structural welders and welding operators shall be qualified in accordance with AWS D1.1, or equivalent codes approved by CB&I. Piping welders and welding operators shall be qualified in accordance with ASME IX or equivalent codes approved by the CB&I.

4.4.2.3 Weld Profile Grinding

Special attention is given to the enhanced weld profiles in the fatigue sensitive structural areas to assure compliance with the requirements of the drawings, as it applies.

4.4.2.4 Welding Records

A review of the construction site welding log or register is performed to assure the data is correct and current. The weld repair rates are also monitored and any trends showing increased weld repair rates are analysed to determine the cause. Increased weld repair rates attributed to a practice, consumable or welder are highlighted to Construction Site Management or subcontractor for corrective action.

4.4.2.5 Welding Consumables

Control of consumables is checked to assure handling, storage and safety precautions are in accordance with manufacturer and project contract requirements. A check is made to assure Data Sheets / Test Certificates, as required, are available for consumables prior to use. Consumables having limited storage are checked to assure the shelf life has not expired.

Welding repair rates are continually monitored on a weekly basis with the emphasis on the determination of trends, showing an increase in the repair rate related to any one aspect such as a welding practice(s), process, joint configuration, filler material or welder performance. These metrics are reported in the appropriate Welding Repair Checklist.

4.5 Dimensional Control

Dimensional control activities relating to the construction site are monitored and verified through a series of report reviews and by witnessing the construction site personnel taking dimensional checks.

4.5.1 Specialized Review

Due to the specialized nature and the equipment involved in dimensional control, CB&I personnel verifying the dimensional control activities of the Construction site work may require additional resources from specialized personnel. If these services are required, the need is determined during the preparation of the ITP.

4.6 Non Destructive Examination (NDE)

4.6.1 The Construction site NDE/ Inspection activities are monitored and verified through verification of inspector's qualifications, daily surveillance and cross-checking of materials, connections, and welds previously inspected by the construction site subcontractor or onsite CB&I personnel. These activities are carried out on a random basis and only by qualified CB&I site Quality personnel. Personnel must be qualified in the NDE/ Inspection techniques being verified.

4.6.2 Particular consideration is given to the construction site practices for the storage, handling and use of ionizing (radiation) sources to assure that all radiographic work can be carried out in a safe manner.

4.6.3 The use of ionizing sources shall be closely monitored to assure the sources are being utilized in a safe manner.

4.6.4 Surveillance within this discipline is carried out mainly on a random basis to monitor the performance of the construction site NDE/ Inspection technicians and to assure that recording of test results is carried out in the prescribed manner. This is achieved by participating in the original inspections and by spot checking of documents (i.e., welding logs). One of the main functions of this activity is to assure that the examination of welds is kept up to date and that no backlog of testing or processing of test results occurs.

4.6.4.1 Visual Examination

The quality of visual examination is verified by examining the materials and welds randomly, on a periodic basis and in critical areas defined in the ITP. If the standard of acceptance is found to be lacking, corrective action is implemented and the action verified to be effective. No further NDE/ Inspection is performed until visual acceptance is achieved.

4.6.4.2 Radiographic Examination

The quality of radiographic examination is verified by reviewing radiographic films randomly on a periodic basis and in critical areas defined in the ITP. The review not only covers the interpretation of the films but also considers quality aspects of the films such as density, definition, film development and sensitivity.

4.6.4.3 Ultrasonic Examination

Ultrasonic Examination is verified by witnessing the examination of critical areas. These areas are identified on the ITP. CB&I may verify the examination at the site by physical cross checking of welds previously examined by construction site personnel or, and any discrepancies between the results are subject to a joint examination and final conclusion. Witnessing the qualification of the process technique may be performed.

4.6.4.4 Magnetic Particle and Liquid Penetrant Examination

Magnetic Particle and Liquid Penetrant Examinations are verified by witnessing the examination of critical areas. These areas are identified on the ITP. Witnessing the qualification of the process technique may be performed.

4.7 Positive Material Identification (PMI)

PMI is verified by witnessing the examination and reviewing the records of critical areas as identified on the ITP. The extent of PMI and methods to be used are specified in CB&I procedures. The CB&I Welding Engineer may be required to be involved in the review and acceptance of PMI methods.

4.8 Surface (Coating, Fire Proofing & Wrapping) Protection

4.8.1 Construction site material and equipment surface protection activities (including subcontractor activities) are monitored and verified through daily surveillance and verification of the coating quality. These activities are carried out on a random basis as determined by the ITP.

4.8.2 The construction site practices for control of environmental conditions in areas where coating is carried out are monitored to assure that the operation is being carried out in a safe and acceptable manner.

4.8.2.1 Coating Qualification Tests

Tests to verify a coating practice are monitored. The preparation and coating of test panels are to be monitored including testing by means of visual examination, thickness measurements and adhesion tests.

4.8.2.2 Operator Qualification

All operators for surface coatings including painting and metalizing are qualified for the relevant process. Qualifications are reviewed and testing is monitored.

4.8.2.3 Environmental Conditions

Environmental conditions and steel temperatures are monitored daily at the start and during application of the coatings.

4.8.2.4 Surface Preparation

Surface preparations are continually monitored on a daily basis. It includes visual examination to assure removal of spatter, surface defects and slag after completion of fabrication. Particular attention to the edges of the material is required to assure the required radius has been achieved in all instances. Visual examination is also carried out on sections prior to blasting to assure that the solvent cleaning and steam cleaning has removed all organic and inorganic contaminates. After blast cleaning, a visual examination is carried out to assure the required finish (cleanliness) has been achieved and the surface roughness is determined by use of a comparator.

4.8.2.5 Coating Application

Dependent on the process, the wet film thickness and/or dry film thicknesses are monitored. Calibration verification of electromagnetic thickness gauges may be performed.

4.8.2.6 Documentation

The construction site coating log is checked and a review of the coating documentation is carried out on a periodic basis. Any increase in repair rate whether attributed to a practice, consumable or operator is highlighted to the construction site supervisor or subcontractor for corrective action where appropriate.

4.8.2.7 Consumables

The control of consumables is checked on a periodic basis to assure they are being stored under the environmental conditions specified by the

manufacturer and that the recommended safety precautions for their storage and handling are being followed. Consumables having limited storage stability shall be checked to assure that they are being used in rotation according to the shelf life expiration date.

4.9 Electrical

4.9.1 The surveillance activities for the electrical discipline are carried out on a random basis reviewing activities from the receipt of equipment, through the installation, testing and preservation to Mechanical Completion/ Ready for Commissioning.

4.9.2 Planned surveillance focuses on aspects where non-conformance could affect the integrity of the development, delay the schedule or result in increased maintenance. These activities are to be provided in the QSR and review the following topics.

4.9.2.1 Receiving Inspection

The construction site receiving inspection system is monitored by the CB&I Quality Representative. The CB&I Quality Representative's verification includes a physical check of the equipment and a review of the documentation to assure that the requirements of the specification have been met. Any discrepancies are reported.

4.9.2.2 Installation of Packages and Equipment

Surveillance is carried out on the installation and testing of packages, high voltage and low voltage cables, earthing and trays as detailed in the QSR. Particular attention regarding the use of the correct 'Ex' rating on equipment, segregation between differing voltages, routing, earthing, termination and the glanding of cables is made.

4.9.2.3 All equipment is monitored during the construction phase to assure preservation is being carried out on a planned basis in accordance with manufacturer recommendations.

4.10 Instrumentation

4.10.1 The status of Mechanical Completion/ Ready for Commissioning (MC) is reviewed periodically to assure completion is on an ongoing basis and that any outstanding work or punch list items, including those originating from the equipment suppliers, are cleared and signed off accordingly.

4.10.2 Electrical Inspector, in conjunction with the commissioning group, assists in the preparation of all punch lists relating to electrical sub-systems, instrument and telecommunication systems.

4.10.3 The construction site installation, testing and preservation of instruments and telecommunications systems are monitored and verified through on-site surveillance and verification.

4.10.4 Attention is provided to calibration of test equipment such as: pressure gauges, welding machines, ultrasonic test equipment and other equipment requiring calibration.

4.10.5 The surveillance activities for instrument and telecommunications are implemented on a random basis reviewing activities from the receipt of equipment, through the installation, testing and preservation to Mechanical Completion/ Ready for Commissioning.

4.10.6 Surveillance focuses on aspects where non-conformance could affect the integrity of the development, delay the schedule or result in increased maintenance. These activities are provided in the ITP and review the following topics:

4.10.6.1 Receiving Inspection

The construction site receiving inspection system is monitored by the CB&I Quality Representative. The CB&I Quality Representative's verification

includes a physical check of the equipment and a review of the documentation to assure that the requirements of the specification have been met. Any discrepancies are reported.

4.10.6.2 Installation of Supplier Packages and Equipment

Surveillance is implemented on the installation and testing of packages, field instruments' cables, tubing and trays.

All equipment is monitored during the construction phase to assure preservation is being carried out on a planned basis in accordance with the manufacturer recommendations.

4.10.6.3 Mechanical Completion/ Ready for Commissioning

The status of Mechanical Completion/ Ready for Commissioning is reviewed monthly to assure it is being completed on an on-going basis and that any outstanding work or punch list items, including those originating from the equipment suppliers, are cleared and signed off accordingly

The Instrumentation Inspector, in conjunction with the commissioning group, assists in the preparation of all punch lists relating to instrumentation and telecom sub-systems.

4.11 Piping

4.11.1 Piping activities are monitored and verified through witnessing of tests identified in the ITP. Additionally, planned and random surveillances are performed as identified below.

4.11.2 Aspects as required by the specifications with regard to flushing (if permitted), pressure testing, chemical cleaning and reinstatement of pipework are reviewed.

4.11.3 Surveillance of piping and mechanical activities is carried out on a random basis to monitor all activities from receipt to Mechanical Completion/ Ready for Commissioning. The surveillance also assures that the work is being documented on an ongoing basis and that punch list work is being recorded and addressed.

4.11.4 Planned surveillance is detailed in the ITP and reviews the installation and testing of pipework to assure that it is in accordance with the project drawings and specifications. The following points are addressed:

- The piping class/ material are correct and the piping (including pipe supports) is installed according to specification and isometric drawings, pipe support drawings and P&ID's;
- The valve type(s), rating(s) and installation direction are correct;
- Following installation, critical pipework is punched to assure compliance with requirements;
- A punch list is produced listing all outstanding items/actions.
- The flushing of selected piping systems is witnessed to assure specification requirements are met;
- Pressure testing practices are reviewed and selected pressure tests are witnessed to assure they comply with the agreed test practices. Special emphasis is placed on safety and the permit to work is checked for the selected tests, prior to any pressure testing;
- Bolt tensioning/ torquing is monitored to assure that it is carried out in accordance with the relevant practice;
- Upon completion of a test, the system is checked to assure that it has been drained (dried when specified), reinstated and system preservation carried out in readiness for release to commissioning;
- When piping is specified to be insulated, a check is made to assure that all coating and where required, heat tracing is complete prior to the application of the insulation.

- The piping is checked to assure that it is correctly identified, direction flow arrows and color-coding are correct and in accordance to specification;
- Any discrepancies found are recorded and brought to the attention of the CB&I Construction Manager and the Construction site subcontractor QC, if applicable.
- Equipment is monitored during the construction phase to assure preservation is being carried out on a planned basis in accordance with manufacturer recommendations and construction site procedures, as applicable.

4.12 Mechanical Completion/ Ready for Commissioning

4.12.1 The status of Mechanical Completion/ Ready for Commissioning is reviewed periodically to assure it is being completed on an on-going basis and that any outstanding work or punch list items, including those originating from the equipment suppliers, are cleared and signed off accordingly.

4.12.2 The Inspector, in conjunction with the commissioning group, assists in the preparation of punch lists relating to piping sub-systems.

4.13 Mechanical Equipment

4.13.1 The mechanical activities are monitored and verified through witnessing of tests. These activities are implemented as determined by the ITP.

4.13.2 Surveillance of mechanical activities is carried out on a random basis to monitor all activities from equipment receipt to Mechanical Completion/ Ready for Commissioning. The surveillance assures that mechanical activities are carried out in accordance with the project drawings, data sheets and specifications.

4.13.3 The planned surveillance of mechanical activities including rotating equipment, pumps, valves etc. is determined in conjunction with Project Engineering. Surveillance activities include, among others, verification of equipment levels, alignment checks, torquing, etc.

4.13.4 All equipment is monitored during the construction phase to assure preservation is being carried out on a planned basis in accordance with manufacturer recommendations. These activities are provided in the ITP and cover the following topics:

4.13.4.1 Receiving Inspection

The construction site receiving inspection system is monitored by the QM. The QM's verification includes a physical check of the equipment and a review of the supplier documentation to assure that the requirements of the specification have been met. Any discrepancy is reported.

4.13.4.2 Mechanical Completion/ Ready for Commissioning

The status of Mechanical Completion/ Ready for Commissioning is reviewed periodically to assure it is being completed on an on-going basis and that any outstanding work or punch list items, including those originating from the equipment suppliers, are cleared and signed off accordingly. The Mechanical Inspector, in conjunction with the commissioning group, assists in the preparation of all punch lists relating to mechanical equipment.

4.14 Insulation

Construction site material and insulation activities (including Subcontractor activities) are monitored and verified through planned and random surveillance and verification activities.

4.15 Preservation

4.15.1 Construction site personnel are responsible for handling, storage and preservation of materials and equipment intended for the project, as the material is turned over.

4.15.2 A spot check is conducted on a periodic basis to assure that preservation records are up to date and manufacturers' preservation requirements and frequencies are in compliance.

5.0 REFERENCES

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary
CMS-720-01-PR-00150	Identification, Control and Disposition of Nonconforming Product
CMS-720-01-PR-00230	Construction Inspection Program
CMS-720-01-FM-00230	Quality Surveillance Report
CMS-720-01-FM-00231	Inspection Monitoring

6.0 TERMINOLOGY

Term	***Definition***
Inspection Surveillance Point (S)	A **Surveillance Point** is established by an interested party for a particular activity which they will monitor periodically. Surveillance shall be documented by sign-off on the Recording Document when the interested party is present during the activity. Surveillance Points are indicated on an ITP with an 'S' Surveillance Points that are specifically assigned to activities on an ITP can be considered **'Planned'** Surveillances and since there will often be no Recording Document for a Surveillance Point, they will be documented on the Quality Surveillance Report
Quality Surveillance Report (QSR)	Report on which the results of "planned" quality surveillances are recorded.
Inspection Monitoring Form	The Form used to log and monitor the results of the planned quality Inspection and Surveillance activities.
Unplanned Surveillance Activities	The following terms are used interchangeably in this procedure; random / periodic surveillance and monitoring. These activities performed by CB&I inspectors, are not identified with an 'S' on the ITP i.e. not 'Planned' surveillance activities.

7.0 EXHIBITS

None

PROCEDURE

Procedure Title:	**Identification, Control, and Disposition of Nonconforming Products**	**CMS Number:**	**CMS-720-01-PR-00150**
Procedure Owner:	**Corporate Quality**	**Issuing Authority:**	**Director Global Quality**

IDENTIFICATION, CONTROL, AND DISPOSITION OF NONCONFORMING PRODUCTS

2	Issued for Use – Total re-write. (No Rev Bars)	PDJ	20 Mar 2014
1	Issued for Use – Incorporated consistency review comments (grammatical), Issuing Authority Approval not required. (No Rev Bars)	BDR	14 Aug 2009
0	Issued for Use	DLK	17 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure describes the process and responsibilities for the identification, control, and disposition of nonconforming product. The objective is a uniform and consistent practice to prevent the unintended use or delivery of product which does not conform to product requirements.

2.0 SCOPE

This procedure applies to all CB&I Business Units and their operations except Nuclear Projects. Supplier related Non-conformance Reports issued by source inspectors are processed in accordance with CMS-760-04-PR-33000.

3.0 RESPONSIBILITIES

The following functions have responsibilities defined in this procedure:

- CB&I Employees (this includes all contracted personnel)
- Subcontractors
- Supervisors
- Engineers
- Quality Manager
- Responsible Managers (or Owners of the Nonconforming product)

4.0 PROCEDURE

4.1 General

Nonconforming product can occur at any stage of a project.

4.2 Identification of Nonconforming Product

4.2.1 A Non-Conformance is a condition that renders the product to be out of compliance with the requirements of the project specifications, codes, specified drawings, etc.

4.2.2 The Quality Manager will review and determine if the reported product is indeed nonconforming.

Unacceptable conditions detected during Non-Destructive Examination (NDE) are considered in-process and are documented on the component or NDE report. Adequate control is provided by the NDE reporting process and therefore these do not need to be treated as nonconforming product.

4.3 Control of Nonconforming Product.

The following controls shall be implemented to prevent unintended use or delivery of nonconforming product:

4.3.1 The Quality Manager shall ensure that all nonconforming products are assigned a unique identifying number.

4.3.2 The Quality Manager will register all nonconforming products with an entry on the project NCR Log (CMS-720-01-FM-00150). The NCR Log should include Client, subcontractor, and Third Party NCRs. NCR Log can be replaced by a client equivalent log or Quality Management Software that shall include the principles and manages the requirements of this procedure.

4.3.3 Nonconforming product may not be released for delivery without documented Conditional Release approved by the Project Manager and Quality Manager.

4.3.4 Hold Tags affixed to the item should be used to help control nonconforming product, or potentially nonconforming product. If the Hold Tag is not practical to use (i.e., the NCR Hold Tag cannot be affixed to a nonconforming item), it shall be noted on the NCR Form. The following minimum information is required on the Hold Tag (CMS-720-01-FM-00152):

- Product identification number
- NCR No.
- Date the non-conformance was identified
- Name of the individual making the observation

4.3.5 When practical, nonconforming product shall be segregated from conforming product. Segregation is to be achieved by placing the item in a designated location that will prevent unintended use.

4.4 Document the Non-conformance

4.4.1 The Quality Manager with the assistance of the Responsible Manager will initiate a Non-conformance Report, NCR, for each instance of nonconforming product unless already documented on special purpose forms described elsewhere in the CMS.

4.4.2 The NCR shall be documented using CMS-720-01-FM-00151. A project specific NCR format may be used only if required by Client. In case of using Client dictated format, Quality Manager shall ensure that the NCR disposition and approvals will include, as a minimum, the requirements defined in this procedure.

4.5 Action for Correction

4.5.1 The Responsible Manager, with assistance from the Quality Manager and, as needed, responsible Engineer, will generate a proposal to eliminate the nonconformity.

4.5.2 This is a narrative of what will be done to eliminate the nonconformity and shall be documented on the NCR. It may include procedures, method statements, ITPs, etc.

4.6 Action By, Date, Target Completion Date

4.6.1 This will define the Responsible Manager of the NCR correction, date, and target completion date.

4.7 Proposed Corrective Action to Prevent Reoccurrence

4.7.1 The Quality Manager will perform a root cause analysis and define the necessary actions to be taken to prevent the non-conformance reoccurrence. If the root cause of Non-conformance is systematic and/or symptomatic, a separate Corrective action shall be issued and followed by Corrective Action Process (CMS-720-01-PR-00170). Corrective Action Request (CAR) number shall be noted on NCR, if issued.

4.8 Disposition and Approval

4.8.1 Based on the agreed Action on nonconformity, the disposition is identified on the NCR.

4.8.2 The Quality Manager shall evaluate each NCR to identify which parties need to approve the proposed Correction.

- As a minimum this shall include the discipline Lead Engineer.
- These approving parties shall be identified on the NCR.
- Quality Manager shall obtain the necessary approvals on recommended disposition as per contractual and applicable codes and standards requirements.

4.8.3 The following defines the baseline requirements for identification and approval requirements of dispositions:

NCR Disposition Approval Matrix

Disposition	Quality Manager Approval	Lead Engineer Approval	Client Approval
REWORK, NO Deviation	Yes	Yes	No
REPAIR, NO Deviation	Yes	Yes	No
REPAIR, Deviation	Yes	Yes	May*
USE-AS-IS, Deviation Acceptable	Yes	Yes	May*
USE-AS-IS, Revise Requirement	Yes	Yes	May**
REJECT	Yes	Yes	May***

* If required by the Contract

** If the requirement is internal to which the item is not conforming, Client approval is not necessary unless the requirement is approved by client previously. If it is a client requirement, Client approval is required.

*** If the nonconforming item is “free issued” by Client, Approval is required

4.8.4 Rework and Repair without deviation does not require Client approval. As a baseline, however, Rework and Repair shall follow contractual requirements from client if applicable.

4.8.5 The Quality Manager is responsible to obtain the approval of the all parties. Any third party approvals required by local codes and standards shall be identified by Quality Manager and shall be obtained.

4.8.6 After approval is obtained, the Quality Manager shall issue the NCR to the Responsible Manager to execute the correction.

4.9 Correct the Nonconforming Product

4.9.1 The Responsible Manager shall correct the Nonconforming Product in accordance with the approved disposition.

4.9.2 After correction the NCR shall be submitted to the Quality Manager to verify the nonconformity has been corrected.

4.10 Verification and Release

4.10.1 The Quality Manager shall review the item and any required documentation to verify satisfactory correction and sign to document his approval.

4.10.2 The Quality Manager shall coordinate the approval and release of other responsible parties before closing out the NCR and releasing the product.

4.10.3 The Quality Manager shall file the closed NCR in the project EDMS and close the item on the NCR Log.

4.10.4 The Quality Manager shall approve the removal of Hold tags (if used).

4.11 NCR Status

4.11.1 The Quality Manager shall regularly review the status of the NCRs for completeness and timely closure.

4.12 Records

4.12.1 NCRs and NCR Logs are quality records and shall be maintained in the project EDMS.

4.13 Process Performance

4.13.1 The Quality Manager is responsible to collect, evaluate, and report corporate metrics via his immediate Functional supervisor.

4.13.2 The Quality Manager shall evaluate NCRs for trends adverse to quality and report status to management each month.

5.0 REFERENCES

CMS-720-01-PR-00170	Corrective and Preventive Action
CMS-760-04-PR-33000	Source Inspection Non-conformance Reports
CMS-720-01-FM-00150	Non-conformance Report (NCR) Log
CMS-720-01-FM-00151	Non-conformance Report (NCR)
CMS-720-01-FM-00152	NCR Hold Tag

6.0 TERMINOLOGY

Term	***Definition***
Concession	Permission to use or release a product that does not conform to specified requirements
Correction	Action to eliminate a detected nonconformity (also referred to a Disposition)
Corrective Action	Action to eliminate the cause of a detected nonconformity or other undesirable situation
Deviation Permit	Permission to depart from the originally specified requirements of a product
NCR	Non-conformance Report
Non-conformance	A non-conformance is the non-fulfilment of requirements.
Product	The result of a process (or set of interrelated or interacting activities which transforms inputs into outputs). There are four generic product categories: • Services • Software • Hardware • Processed Materials
Repair	Action on a nonconforming product to make it acceptable for the intended use
Reprocess/In Process	The product is returned to manufacturing to repeat standard operations steps, including inspections and tests, with the intent to correct the non-conformance.
Responsible Manager	Responsible Manager is the person responsible to execute the corrections/ corrective actions defined in the NCR report and is part of the Project/ Construction/Fabrication Management Team

Term	***Definition***
Requirement	A requirement is a need or expectation that is either: • Stated • Generally implied to be a custom or common practice for CB&I, its customer, and other interested parties • Obligatory
Rework	Action on a nonconforming product to make it conform to the requirements
Use-as-Is	Releasing the nonconforming item as it is after considerations and approval of: • Deviation from requirements are within acceptable limits • Revising the requirements

7.0 EXHIBITS

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary

8.0 ATTACHEMENTS

None

PROCEDURE

Procedure Title:	**Corrective and Preventive Action**	**CMS Number:**	**CMS-720-01-PR-00170**
Procedure Owner:	**Corporate Quality**	**Issuing Authority:**	**Senior VP Global Systems**

CORRECTIVE AND PREVENTIVE ACTION

2	Issued for Use – Incorporated consistency review comments (grammatical), Issuing Authority approval not required. (No Rev Bars)	BDR	22 Sep 2009
1	Issued for Use – Added specific responsibilities throughout, added sections 4.6.7.1, 4.6.7.2 and 4.7.1, added hyperlinks to section 5.0 (see rev bars).	BDO	10 May 2009
0	Issued for Use	DLK	17 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure establishes the program for the identification of existing and potential systemic type nonconformities and issues representing conditions adverse to the achievement of Quality. This procedure defines the analysis of data, assignment of responsibility, and development and implementation of appropriate corrective and preventive actions (CA/PA) within CB&I.

2.0 SCOPE

This procedure applies to all CB&I Project Operation Units and describes the corrective and preventive action program within CB&I.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this procedure:

- CB&I Executive Management
- Director of Global Quality
- Management Team
- Process Owners
- Responsible Person (Auditee or Auditees Line Manager or Owner of the Process being audited)
- Project Operations Unit Quality Manager
- Project Quality Manager

4.0 PROCEDURE

4.1 General

4.1.1 CB&I Executive Management is responsible for providing the resources necessary to assure the effective implementation of the CA/PA program. Executive Management is also responsible for monitoring corrective actions as an integral part of the Management Review process, and for supporting the implementation of required corrective and preventive actions.

4.1.2 The Director of Global Quality, Project Operations Unit (POU) Quality Manager and Project Quality Managers are responsible for the following:

- Ensuring a uniform and consistent approach for establishing corrective and preventive action controls within the organization
- Establishing the CB&I Global, Project Operations Unit CA/PA implementation procedures
- Providing input to CB&I Management Reviews
- Ensuring resolution of escalated organizational issues
- Final authority for decisions.

4.1.3 The Management Team consists of applicable Corporate, Project Operations, Manufacturing or Site Level Unit Management and Quality Management personnel. This team may also include representatives from design engineering or appropriate functions as needed. The team has a leader who is responsible for the following activities:

- Review of CA/PA inputs
- Assignment and tracking of Corrective Action Requests
- Review of Corrective Action Plans
- Verification of the effectiveness of Corrective and Preventive Actions

4.1.4 The Process Owner or designee is responsible for the following:

- Accountability for a specific business process within the CB&I organization.

- Collecting, trending, monitoring, analyzing, initiating and reporting applicable categories for potential corrective and preventive actions within their functional groups,
- Investigating and the implementation of corrective and preventive actions assigned to their functional groups by the Management Team.

4.2 Corrective Action (CA)

4.2.1 Input Guidelines

The following guidelines are used to determine if an individual input is classified as requiring a corrective action (CA):

- The allocation and implementation of a Corrective Action will be based on the potential "risk" to the company activities.
- Issues representing significant conditions adverse to the achievement of Quality.
- Systemic, recurring or trends of nonconformities occurring in one, some, or all Project Operations, Fabrication and Site/ Project Level Units within CB&I.
- Systemic Project Operations Unit nonconformities which require the attention of Global Quality Management
- Repetitive conditions which should receive management attention to preclude repetition. This would include other similar conditions of major significance.
- A significant design error found after the component has been completed and accepted.
- Conditions indicative of either a fundamental material problem or process out of control.
- Recurring audit findings of non-conformity
- Executive Management Review results representing significant risk to the business or significant non-conformities

4.2.2 Potential corrective action input must contain the following information:

- A clearly defined problem statement
- The procedure, requirement or standard that is being or has the potential of being violated
- Objective evidence to support the problem statement

4.3 Preventive Action (PA)

Preventive action is the use of tools, techniques, and analysis of data in order to anticipate potential problems or identify undesirable trends. Corrective/ Preventive Action Requests (Quality CAR's) requiring preventive action may be generated from, but are not limited to the following sources:

- Input from CB&I employees or other sources
- Quality indicator trending – Analysis of Quality System data which prompts investigation for a negative performance trend such as results from process monitoring, Key Performance Indicators (KPI) analysis or client perceptions.

4.4 Corrective and Preventive Action (CA/PA)

Quality CAR's requiring corrective action are generated from, but are not limited to the following sources. These same sources may also result in preventive actions:

- Issues identified during the performance of internal or external audits may be escalated into the CA/PA process for investigation
- Re – current, non-conformities that require escalation as a Corrective Action

- Management Team review of key metrics and nonconformity trends to identify and act on unacceptable performance or unfavorable trends, which could indicate issues with the overall Quality System
- Direct inputs of isolated issues from clients or employees such as significant design errors found after the item has been completed and accepted. These inputs may be directed to any member of the Management Team within a timely manner via email or any other means of communication.
- Issues identified as an output of the Management Review process.
- Any failure in process to conform to state, federal, or other applicable code requirements.

4.5 Observations

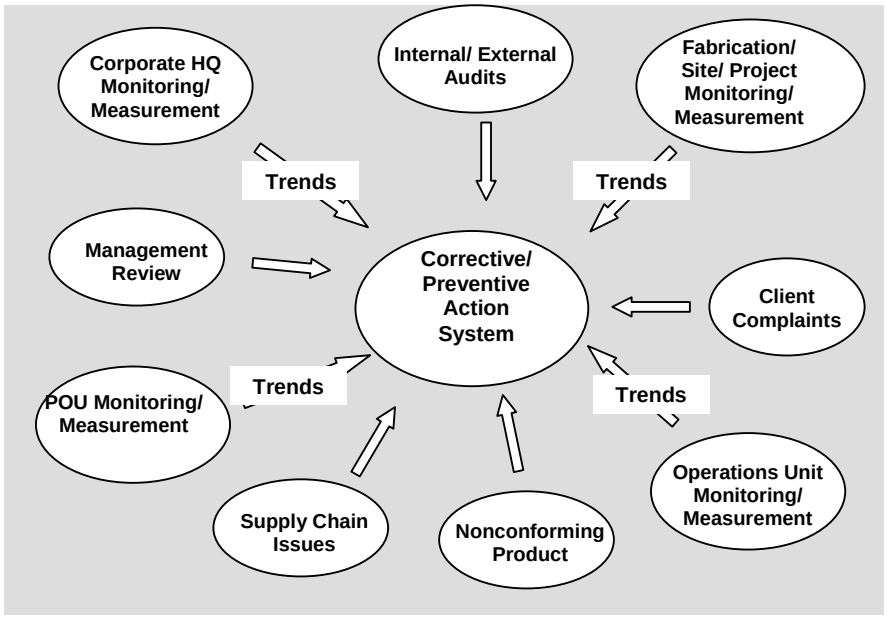
4.5.1 Situations may exist during an audit where the Management Team identifies activities that are potentially non-conforming or may require improvement, but do not present an immediate "risk" to the Project or Audit being undertaken.

4.5.2 The Management Team may recommend recording the activity as an "Observation" within the Audit Report for future reference and for the Responsible Person / Process Owner to periodically review to prevent potential escalation

4.6 General Requirements

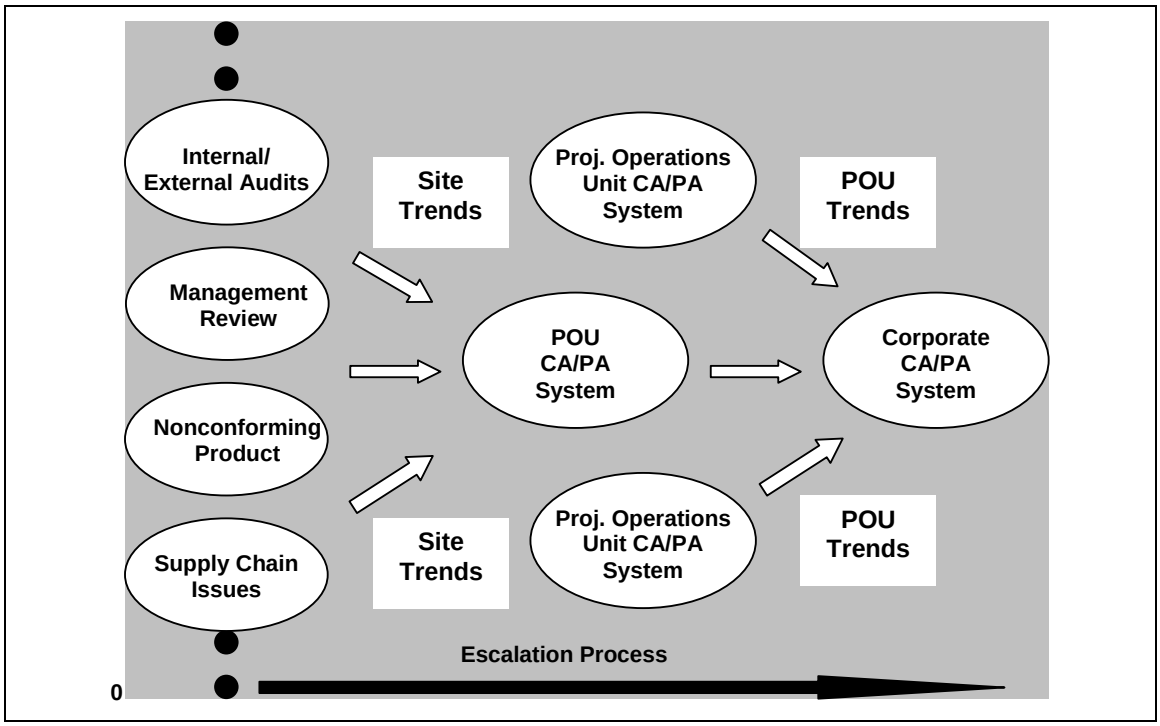
4.6.1 General

4.6.1.1 In addition to those inputs described above, the following procedures/ processes are related to the CA/PA Process:



4.6.1.2 Actual CB&I procedures, among others, relating to the CA/PA process or serving as inputs to the CA/PA processes are listed in the reference section of this document.

4.6.1.3 In addition, the CA/PA Process is generally viewed as a Global escalation process as depicted below:



4.6.2 Elements of an effective CA/PA Process

Regardless as to whether the action/ activities are considered Corrective or Preventive, an effective CA/PA Process includes the following elements:

- Analysis
- Investigation
- Identification of action required to correct or prevent issues
- Verification of effectiveness of corrective or preventive action after implementation
- Dissemination of information and communication with Executive Management

4.6.3 Elements of an Effective Investigation process include:

4.6.3.1 Problem Identification and Definition

- Demonstration of an understanding of the scope and impact of issue
- Evidence of immediate steps taken to limit or contain the damage.

4.6.3.2 Root Cause Investigation

- Evidence of investigation to determine the fundamental cause(s) of the issue
- Documented evidence as to the results of the investigation to include the results of the analysis, determination of failure modes, and conclusions as to the root cause(s).

4.6.3.3 Rationale

- If an investigation is not performed, the justification for not performing the investigation is documented.
- The documentation should include the name of the person responsible for the decision and date.

4.6.4 Reviews

The Management Team shall hold periodic, e.g. quarterly, meetings with the applicable functional Process Owners to review key metrics for trends. Other inputs may be evaluated at this time as well. This review considers the following:

- During situations when isolated issues from clients or employees are communicated to a member of the Management Team, the member evaluates the issue based upon its business risk, systemic nature or failure to conform to state or federal regulations.
- If the evaluation concludes that the issue may contribute to a business risk, system issue or a potential regulatory, code authority non conformance, the member assembles an “ad hoc” Management Team meeting as soon as possible to discuss the issue and determine the course of action mitigating the issue. This may include engineering or Project Operations Unit (POU) management.
- All other issues received are reviewed during the next scheduled periodic meeting.

4.6.5 CA/PA Determination

The Management Team will review each source input to determine whether it is to be considered a “CA/PA”. If the input is determined to be a “CA/PA” then the following shall occur:

- A unique identification number shall be assigned
- An investigator (generally the process owner or designee) is assigned
- A due date is established. Typically, the due date is 30 days from the issue date, but can be adjusted depending upon the severity or complexity of the issue.

4.6.6 Acknowledgement

If a client initiates the issue, an acknowledgement letter shall be sent to the client unless it is not in the best interest of CB&I (e.g. in the case of open or potential litigation) in which case a client letter will not be issued. This will be documented in the CA/PA files.

4.6.7 Investigation

4.6.7.1 The assigned Responsible Person is notified by a “Corrective/ Preventive Action Request” (Quality CAR). The Quality CAR will contain the relevant information regarding the issue and the scheduled response date. The Responsible Person will develop the Corrective Action Plan, milestones, if applicable, and completion deadline.

4.6.7.2 The Responsible Person will be allocated a maximum of (5) working days with which to respond to the Auditor in writing, as to the proposed Corrective Action to clear the Non-Conformance. Following agreement by the Auditor, both parties will have a maximum of (2) months with which to implement the Corrective Action and verify its acceptance.

4.6.7.3 Should more time be required for implementation, then the Responsible Person will confirm in writing to their Line Manager, Auditor and the Project Operations Unit Quality Manager the reason(s) for the proposed extension.

4.6.7.4 Each Corrective Action Report shall be identified by a prefix relating to the project (and/or audit) and numbering individual CAR’s sequentially.

4.6.7.5 The Line Manager of the Auditee and Project Operations Unit Quality Manager will monitor the progress of the plan’s implementation and report to the Management Team of significant changes to the schedule. The

Management Team will determine the acceptability of significant changes to the plan, and may determine if escalation is required if the plan is not met.

4.6.8 Closure

Upon completion of the Corrective Action Plan, the Responsible Person will review the actions to ensure the issue has been addressed.

- CA/PA closure methods may include additional training, process modification, etc.
- Adequate Quality CAR responses should include objective supporting documentation or other evidence to facilitate closure whenever possible.
- The Line Manager of the Auditee and Project Operations Unit Quality Manager may determine that additional action or further verification is required, and can request additional activity.
- If the Line Manager of the Auditee and Project Operations Unit Quality Manager determine the Corrective Actions have adequately addressed the issue, the CA/PA issue is closed. The Line Manager of the Auditee signs off on the "Corrective/ Preventive Action Request".

4.6.9 Verification of Effectiveness

Effectiveness and verification checks may consist of a review of documentation (e.g. training records, etc) or other objective evidence that illustrates that potential for recurrence has been minimized. This information is included in the CA/PA files as part of closure.

4.7 Records

The Responsible Person and/or Process Owner may maintain all documentation regarding the CA/PA until the CA/PA is closed, at which time any documents supporting the investigation or CA/PA activities are transferred to the Quality Managers or Director, GQM to be maintained in the CA/PA file. Records resulting from this procedure are maintained as follows:

Identification	Storage	Protection	Retrieval	Retention	Disposition
CA/PA File (Completed Quality CAR and associated documentation)	Electronic Document Management System	Software Backup/ Retrieval Controls	Quality Managers; Corporate Director, GQM	See CMS-810-00-PR-00018, Archiving and Storage of Project Documents	See CMS-810-00-PR-00018, Archiving and Storage of Project Documents

5.0 REFERENCES

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary
CMS-720-01-PR-00150	Identification, Control and Disposition of Nonconforming Product
CMS-720-01-PR-00220	Internal Quality Management System Audits
CMS-720-01-PR-00230	Subcontractor Quality Surveillance Program
CMS-720-01-PR-00240	Quality System Management Review
CMS-720-01-PR-00280	Module/ Equipment Receiving Inspection (Fabrication Plant and Site)
CMS-810-00-PR-00018	Archiving and Storage of Project Documents

6.0 TERMINOLOGY

Term	***Definition***
CA/PA	Acronym for Corrective and Preventive Action. A system of formally documenting activities for corrective and preventive actions.
Closed CA/PA Action	A CA/PA is considered as "Closed", when it is determined that all CA/PA activities have been completed and verified, when appropriate.
Corrective Action	Actions taken to eliminate the causes of detected nonconformities, Project Operations issues or other undesirable situations in order to prevent recurrence.
KPI	Acronym for Key Performance Indicator.
Management Team	A team consisting of Corporate, Project Operations, Fabrication or Site/ Project Level Unit Management and appropriate representatives who review process type issues for CA/PA reporting. This team may also consist of a representative from the design engineering group or POU functions.
POU	Project Operations Unit
Preventive Action	Actions taken to eliminate the causes of a potential non-conformity, defect or other undesirable situation as identified by trend or other analysis.
Quality CAR	Acronym for Corrective/ Preventive Action Request. The form and all associated documentation used to document Quality related CA/PA activities.
Verification	Confirmation by examination and provision of objective evidence that specified requirements have been fulfilled.

7.0 EXHIBITS

Exhibit 7.1 CMS-720-01-FM-00170 - Corrective/ Preventive Action Report (CAR)

PROCEDURE

Procedure Title:	**Internal Quality Audits**	**CMS Number:**	**CMS-720-01-PR-00220**
Procedure Owner:	**Global Quality**	**Issuing Authority:**	**Director Global Quality**

INTERNAL QUALITY AUDITS

7	Issued forUse – Total rewrite, cleaned up track changes (No Rev Bars)	PDJ	03 Jun 2013
6	Issued for Use – Revised section 3.0 and 4.1.1 to include GFN Leaders. No change to content. Issuing Authority Approval not required. (See Rev Bars)	LDH	17 Dec 2012
0	Issued for Use	DLK	17 Jul 2008
Rev	**Changes**	**Approved**	**Date**

1.0 PURPOSE

This procedure establishes the responsibilities and practices for managing and conducting internal quality audits.

2.0 SCOPE

This procedure applies to all internal quality audits performed at CB&I.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined within this procedure:

- Executives and Senior Management
- Director Global Quality
- Global Functional Network (GFN) Leaders
- Quality Directors
- Quality Managers (at all levels)
- Internal Quality Auditors (Lead Auditors and Auditors)
- Audit Contact (Auditee)

4.0 PROCEDURE

4.1 General

4.1.1 CB&I executives and GFN Leaders are responsible for ensuring CMS processes and procedures are continually improved, effective and are responsible for corrective and preventive actions resulting from internal quality audits.

4.1.2 Internal quality audits are used to evaluate the performance and effectiveness of the CB&I Management System (CMS) at all CB&I locations.

4.1.3 The Director Global Quality has overall authority and responsibility for the development of internal quality audit processes and procedures. Additional responsibilities include:

- develops corporate internal quality audit programs identifying the auditable area, region/location, operating group, business unit , or project point of contact, audit team, and audit date;
- appoints qualified audit personnel to conduct corporate-level internal quality audits; coordinates and supports quality directors, and managers, with planning, staffing, and execution of audits.

4.1.4 Quality directors and managers are responsible for planning, staffing and execution of quality audits in their respective areas.

4.2 Audit Objectives

4.2.1 Audit objectives may vary according to the region/location, operating group, business unit, project, and subject matter.

4.2.1.1 Global quality audits are generally broad in scope, focus on business operations, and gather evidence to determine conformity to CMS processes and procedures.

4.2.1.2 Quality audits are conducted to appraise internal operations, determine the level of conformity to quality manuals, and examine the functionality of CMS processes and procedures. Audits at this level may also examine third-party certification requirements, supplier performance, code and regulatory compliance applicable to the business unit and sample project activities.

4.2.1.3 Quality audits of projects are conducted to verify conformance to specific project management plans, codes/regulations, client, and CMS

requirements. The scope of project audits may include sub-contractors, material suppliers, fabricators (CB&I and others), and any or all functions related to project execution,

4.3 Audit Personnel

4.3.1 Quality auditors shall be qualified and independent of the function being audited.

4.3.2 Lead quality auditors and audit staff designated by quality directors or managers are responsible for the execution of audits.

4.3.3 Quality Directors and managers shall maintain records of auditor training, qualifications, and periodically assess the performance of audit personnel. Details on auditor qualification are provided in CMS-720-01-GL-00223 Qualification and Assessment of Internal Quality Audit Personnel.

4.4 Audit Programs

4.4.1 Quality directors and managers shall develop an audit program comprised of a comprehensive list of auditable locations, or projects, functional groups, and an audit schedule within their scope of responsibility.

4.4.2 The audit program shall consider various factors including, but not limited to:

- current status and effectiveness of quality management performance during product realization e.g., design, engineering, procurement, construction, fabrication, and commissioning;
- outcomes of previous audits, assessments, trends, management reviews, and customer feedback;
- results of oversight activities by government regulatory agencies, third-party certification bodies, or standards organizations;
- effects of changes related to management structure, re-organization, and program functionality, and;
- potential for loss or adverse affects upon human health and safety, or environmental impacts.

4.4.3 Project audit programs may be stand-alone documents, or incorporated into project specific documents, or project quality plans. Project audit programs evaluate conformance to client requirements, conformance to project quality plans, CMS requirements and contract terms.

4.4.4 A list of auditable functions or topics shall be reviewed regularly and updated by the director and/or quality managers using output from management reviews, past audit performance, potential or frequency of factors listed in paragraph 4.4.2, and the availability of audit personnel and other sources as appropriate.

4.4.5 An audit schedule shall be developed by the director and quality manager for their areas of responsibility that considers the maturity of the quality management program.

4.4.6 Audit program development is detailed in CMS-720-01-WI-00220 Work Instruction for Internal Quality Audits.

4.5 Audit Notification

4.5.1 Not less than two (2) weeks prior to the audit, the lead auditor shall notify the audited organization, location or project via the quality management database. The notification shall include the audit start date, proposed audit activities, and a single point of contact.

4.5.2 If the notification form letter Audit Plan/Notification (CMS-720-01-FM-00220) is used, send the form by email to the audited organization and include the audit plan from the quality management database. Details are provided in CMS-720-01-WI-00220 Work Instruction for Internal Quality Audits.

4.6 Use of the Quality Management Database

4.6.1 Use of the quality management database is mandatory for all CB&I business units and projects for audit planning, reporting, and corrective action management.

4.6.2 The quality management database shall be used by auditors to:

- Develop specific audit plans and checklists
- Record all audit information and notes
- Electronically record and capture audit observations and audit findings
- Monitor and track corrective action
- Generate reports and track close-out status

4.6.3 Use of "Finding Only Reports" in the quality management database is the exception, not the rule. In the rare instance when the quality management database cannot be used due to operational constraints, use the following hardcopy forms for recording audit information:

- Audit Plan/Notification CMS-720-01-FM-00220
- Audit Finding Form CMS-720-01-FM-00221
- Audit Report CMS-720-01-FM-00222

4.6.4 Further information on the use of the quality management database is detailed in CMS-720-01-WI-00220 Work Instruction for Internal Quality Audits.

4.7 Auditing

4.7.1 Audits begin with an opening meeting where the participants are introduced to the audit team, audit topics are discussed, the schedule is refined, and any questions regarding the audit are answered. Attendee names shall be recorded.

4.7.2 Audit nonconformities (findings) are conveyed as opportunities to improve a process, procedure, or the performance of work outputs and are supported by objective evidence. Individuals are not named in the finding.

4.7.3 Nonconformities (findings) related to the functionality of CMS work processes or procedures, are directed to the GFN for corrective action.

4.7.4 All other nonconformities (findings) of conditions that do not conform to requirements stated in primary CMS work processes or procedure are directed to the audit contact person in the applicable organization for corrective action.

4.7.5 All nonconformities (findings) require corrective actions (quality actions) in the quality management database.

4.7.6 Positive observations, if evident during the audit, are conditions recognized as best practices or exemplary performance that may be recorded by auditors in the final report.

4.7.7 Conversely, auditors may observe isolated conditions of minor consequence or significance and record these conditions as observations. Observations may present potential conditions, when un-reported, may result in functional deficiencies or deviation from processes or procedures.

4.7.8 Unless directed by the Lead Auditor, observations do not require corrective actions (quality actions) in the quality management database.

4.7.9 The audit concludes when all functional areas are examined. A closing meeting is held to convey audit results and attendee names are recorded.

4.7.10 CMS-720-01-WI-00220 Work Instruction for Internal Quality Audits provides additional information tor auditors on how to carry out audits.

4.8 Audit Reporting

4.8.1 Audit reports shall be submitted by the lead auditor to the audit contact (designated by the audited organization) within two (2) weeks from the audit closing date.

4.8.2 With the exception of Corporate (CMS) findings identified in audit reports shall be directed to the audit contact designated by the audited organization.

4.8.3 Corporate-level CMS findings identified in audit reports shall be directed to the Global Functional Network (GFN) Team Leader.

4.8.4 CMS-720-01-WI-00220 Work Instruction for Internal Quality Audits provides auditors with specific details on report distribution.

4.8.5 To ensure timely close-out and, to facilitate accurate reporting of key performance indicators (KPI's), the lead auditor and audited organization shall reach mutual agreement on the corrective actions for audit findings.

4.9 Corrective Actions

4.9.1 With the exception of Corporate (CMS) nonconformities Corrective actions shall be assigned by the audit contact to the applicable manager or process owner of the audited organization for resolution.

4.9.2 Corporate (CMS) nonconformities (findings) are assigned to the appropriate Global Functional Network (GFN) Team Leader by the Lead Auditor.

4.9.3 Corrective actions shall be processed in conjunction with CMS-720-01-PR-00170 Corrective and Preventive Action and the detailed steps described below.

4.9.4 No later than ten business days after receipt of the audit report, recipients of audit findings shall develop quality actions in the quality management database application.

4.9.4.1 To create a quality action, open the quality management database application and enter the required information identified with an asterisk (Due Date, Assigned To, and Action Title.

4.9.4.2 Describe the plans to affect corrective and preventive action.

4.9.4.3 Periodically update the Action Progress.

4.9.5 If a quality action requires more than one assignee or several tasks, a new quality action may be added.

4.9.6 Evidence of completed corrective and preventive actions are documented and added as a new file attachment to the quality action.

4.9.7 Upon completion of the corrective and preventive action(s), the action assignee enters the relevant information in the quality management database, to include downloading all relevant documents providing evidence of corrective action, and selects 'Save'. Saving the quality action results in sending an e-mail alert to the person who originally assigned the action.

4.10 Audit Performance and Follow-up

4.10.1 Quality directors and managers shall record the audit performance of quality management processes on a suitable spreadsheet as an input to their management reviews and to the Director Global Quality for summarization into the annual global review. In addition, directors and managers shall:

4.10.1.1 Report monthly KPI data for consolidation into executive summaries.

4.10.1.2 Monitor corrective actions resulting from audit findings to ensure timely close-out.

4.10.1.3 Verify effectiveness of implemented corrective actions during follow-up audits.

4.11 Audit Records

Audit records are stored in the Quality Management Database.

5.0 REFERENCES

CMS-720-01-PR-00170	Corrective and Preventive Action
CMS-720-01-PR-00270	Control of Quality Records
CMS-720-01-GL-00223	Qualification and Assessment of Internal Quality Audit Personnel
CMS-720-01-WI-00220	Work Instruction for Internal Quality Audits
CMS-720-01-FM-00220	Audit Plan/Notification
CMS-720-01-FM-00221	Audit Finding Form
CMS-720-01-FM-00222	Audit Report

6.0 TERMINOLOGY

Term	***Definition***
Audit Finding	In the context of quality management system audits, the term “audit finding” is synonymous with nonconformity to specified requirements.
Audit Observation	Audit observations can indicate either conformity or nonconformity with audit criteria, or opportunities for improvement.
Audit Program	All activities necessary for planning, organizing, and conducting a set of one or more audits for a specific time frame and purpose.
Objective Evidence	Verifiable, qualitative or quantitative information, records, or statements of fact pertaining to the quality of an item or service, or to the existence and implementation of a quality system element, which is based on observation, measurement, or test and can be verified.
Quality Management Database	The computer application used in the planning and execution of internal quality audits. The quality management database is designed to record audit information, create audit reports, finding reports, corrective actions, and summarize audit information in management reviews.

7.0 EXHIBITS

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary

8.0 ATTACHMENTS

None

GUIDELINE

Guideline Title:	**Qualification and Assessment of Internal Quality Auditors**	**CMS Number:**	**CMS-720-01-GL-00223**
Guideline Owner:	**Global Quality**	**Issuing Authority:**	**Director Global Quality**

QUALIFICATION AND ASSESSMENT OF INTERNAL QUALITY AUDITORS

1	Issued for Use – Total re-write	PdJ	10 Jun 2013
0	Issued for Use	PdJ	05 Dec 2012
Rev	**Changes**	**Approved**	**Date**

Qualification and Assessment of Internal Quality Auditors

CMS Number:	Revision:	Approval Date:
CMS-720-01-GL-00223	1	30 Jun 2013

1.0 PURPOSE

This guideline establishes the minimum qualification criteria and methods to periodically assess and qualify quality audit personnel.

2.0 SCOPE

The scope of this guideline applies globally to designated audit personnel.

3.0 RESPONSIBILITIES

The following personnel have responsibilities defined in this guideline:

- Global Quality Director
- Quality Directors
- Quality Managers
- Lead Auditors
- Auditors

4.0 GUIDELINE

4.1 The practices set forth in this document apply to persons designated as lead auditors and auditors. This guideline provides criteria for minimum work experience, education, and training and methods for proficiency assessment of audit personnel.

4.2 Regulatory (e.g., government or international standards) or certified quality management systems may mandate auditor qualifications more stringent than described in this guideline. In such cases, specific auditor qualifications are developed to meet applicable requirements.

4.3 Directors and managers are responsible for designating qualified and competent audit personnel. In all cases, audit personnel must be independent of the activity or function being audited.

4.4 Qualification criteria for audit personnel is detailed in the table below:

Parameter	Auditor	Lead Audit
Education	Attend course(s) in ISO 9001 Internal Auditing or equivalent.	Same
OJT Training	On an audit team as an observer for at least 3 audits.	Observed as an auditor by a lead auditor; participated on audit team for at least 3 audits.
Experience	N/A	Complete one audit as lead quality auditor, with a qualified lead quality auditor.
Competence	N/A	Demonstrated ability to conduct audits on time, professionally, & with minimum supervision.

4.5 The director or quality manager may consider credit for past audit experience relevant to:

- Certification or registration agencies
- Quality management systems
- Quality assurance programs
- Corporate internal audits
- Regulatory compliance audits
- Second and third party audits

- Surveillance and assessments of projects, suppliers or vendors, engineering, procurement, fabrication and construction companies.

4.6 Auditors and lead auditors maintain their proficiency through active participation in at least one audit per year or may receive additional auditor training as directed by their manager or director.

4.7 Lead auditors and auditors will be assessed initially and annually by their respective manager or director. Results of proficiency assessments and qualification shall be recorded on CMS-720-01-FM-00223 Auditor Proficiency Assessment and Qualification Record and maintained by the issuing manager or quality director.

4.7.1 Assessment of auditor qualification should include the following information:

4.7.1.1 Audit participation (lead or audit team)

4.7.1.2 Number of audits performed in the last calendar year)

4.7.1.3 Auditor training

4.7.2 Proficiency assessments by managers or directors may include:

4.7.2.1 Review of the audit plan.

4.7.2.2 Discussion of auditor performance, communication, or proficiency with audit attendees or individuals interviewed.

4.7.2.3 Timeliness of audit notification

4.7.2.4 Effectiveness of audit findings.

4.7.2.5 Content of audit report

4.7.3 Results of annual proficiency assessments are recorded on CMS-720-01-FM-00224 Auditor Proficiency Assessment and Qualification Record.

4.8 Records of auditor training are maintained according to CMS-500-03-PR-00001 Training and Development and CMS-500-03-WI-00010 Recording Training - Global. The Auditor Proficiency and Qualification Record (CMS-720-01-FM-00224) shall be maintained by the respective manager or director.

5.0 REFERENCES

CMS-720-01-FM-00020	Business Glossary
CMS-720-01-FM-00021	Technical Glossary
CMS-720-01-PR-00220	Internal Audit Procedure
CMS-720-01-WI-00220	Work Instructions for Internal Quality Audits
CMS-720-01-FM-00224	Auditor Proficiency Assessment and Qualification Record
CMS-500-03-PR-00001	Training and Development

6.0 TERMINOLOGY

None

7.0 EXHIBITS

None

1. PURPOSE

The purpose of this procedure is to provide instructions for performing and documenting independent, management-directed assessments of project activities and functional areas.

2. SCOPE

This procedure is applicable when conducting management-directed quality/independent assessments on Shaw E&I projects and functional areas. Quality Audits are managed in accordance with EIG-Q-009. Surveillances are managed in accordance with EIP-Q-006.

3. REFERENCES

- Shaw E&I *Quality Management System Manual*
- EIP-Q-006, "Surveillance"
- EIG-Q-007, "Nonconformance Reporting"
- EIG-Q-008, "Corrective Action Requests"
- EIG-Q-009, "Quality Audits"

4. DEFINITIONS

- **Assessment**—Targeted evaluation of activities, processes, functional areas, or project performance conducted to identify performance weaknesses, provide insights to management, or identify best practices to promote improvement across E&I organizations.
- **Assessor**—Individual assigned by Quality Services management to plan and conduct assessment activities and report results. Individuals are selected based on experience or familiarity with areas included in the scope.
- **Opportunity for Improvement (OFI)**—A recommendation for improvement not necessarily based upon requirements but focused upon process improvement opportunities. An OFI may also be a statement of fact regarding the potential for a noncompliance which could lead to a more serious problem if not identified and/or corrected, but which does not constitute a lack of compliance with established requirements.

5. RESPONSIBILITIES

5.1 Director of Quality Services

The Director of Quality Services is responsible for coordinating corporate sponsored management assessments. Responsibilities include scheduling, resource planning, and tracking of resolution of issues identified during assessment activities. The Director of Quality Services may delegate some or all of these duties to the Audit Program Manager. The Legal Department may be consulted if the information may potentially be considered business sensitive.

5.2 Responsible Manager

The Responsible Manager shall provide access to all personnel and material required for the performance of assessment activities. This is to include any necessary training, clearances, and restrictions to include any photography limitations. He or she shall also ensure necessary and timely corrective action for issues identified during assessment activities. He or she shall

disseminate any relevant corrective actions or lessons learned to their affected organizations to preclude recurrence.

5.3 Assessment Team Lead

The Assessment Team Lead is responsible for coordinating the assessment within the constraints defined by the Management Sponsor and providing leadership to other assessment team members. Whenever possible, assessment activities should be performed in a manner that is not disruptive to ongoing work or operations.

5.4 Assessor

Prepare for the assessment by reviewing documents relevant to their assigned scope. Follow directions of the Lead Assessor and conduct themselves in a professional manner consistent with the conduct of audits. Maintain all information in strict confidence.

5.5 Management Sponsor

Management assessments shall be initiated at the request of a responsible level of management. This typically includes executive management, Operations Management, and Business Management leadership. Objectives should be defined.

5.6 Legal Department

The Legal Department shall communicate any necessary restrictions for the management of sensitive information.

6. PROCEDURE

An assessment may be formal or informal based on management expectations. Assessments may provide an independent evaluation of scope, status, adequacy, programmatic compliance, and/or implementation effectiveness of quality or business processes. An assessment may be focused on a single activity or process within an individual work group. Management assessments are typically unplanned and are initiated at the direction of a responsible level of management.

Assessments shall be based upon requirements and/or management policies and expectations and shall be performed to assess the conformance of an activity or function to the specified requirements.

6.1 Planning

The Management Sponsor should be consulted to ensure the objectives of the assessment are understood. If necessary, the Legal Department should be consulted if the assessment should be managed as a business sensitive work product. Assessment planning should include review of all documents and requirements relative to the subject and scope of the assessment. Documents to be reviewed may include the following, as applicable:

- Shaw E&I *Quality Management System Manual*
- Shaw E&I procedures that apply to the activity, product, or service
- Legal and contractual documents
- Specifications
- Codes, standards, or regulatory requirements
- Project work plans, instructions, drawings, and project-specific procedures

- Project quality plans
- Project status reports
- Input from senior and/or project management

A Management Assessment Plan (EI-Q014.01, or equivalent) should be completed to organize assessment planning information.

6.2 Preparation

Based upon the scope and the documented requirements, the Lead Assessor should determine the method for conducting the assessment. Methods may include personnel interviews, observing activities, and/or reviewing documentation.

The Lead Assessor shall obtain an assessment number from the E&I Audit Program Manager for assessments managed by corporate resources. Responsible management or input from the sponsor should be solicited for any special concerns and should be included on the assessment plan. The assessment plan and any associated checklists prepared to guide assessment activities should be approved for use by the Lead Assessor.

Responsible management of the organization/area to be evaluated should be notified of assessment logistics and scope by e-mail or memorandum. Attachment 2 provides a representative example.

6.3 Performance

Assessors shall use the following methods, as applicable, to meet assessment objectives:

- Conduct interviews with knowledgeable individuals.
- Review the supporting documentation and records as available.
- Observe real time work performance or operational activity.
- Perform analysis of past, present, and future state performance.
- Assess competency of assigned resources.
- Assess the effectiveness of assigned management.
- Evaluate the effectiveness and efficiency of existing work processes to meet performance objectives.
- Based upon observations and reviews, determine the degree of conformance to the applicable requirements. Consider the potential consequences that not meeting requirements may have to the client or in mitigating Shaw's performance risk.
- Solicit input from knowledgeable management or technical resources as needed.
- Identify recommendations for process modification, staffing, training, organizational changes, or other means for continual improvement.
- Document conclusions and reference information used to formulate the conclusions (e.g., checklists, notes).
- Performance observations should be communicated to the Management Sponsor and the Director of Quality Services.

6.4 Reporting

Efforts should be made during the assessment process to clearly communicate observations to responsible supervision. A post-assessment briefing shall be offered to the Responsible Manager and Management Sponsor to review results and any issues, deficiencies, or performance improvement insights. This briefing should be verbal and may include a written draft summary.

Assessment activities may be documented on a final assessment report, depending on the needs of the Management Sponsor. The Lead Assessor should provide the draft report for review and comment by the Responsible Manager prior to issuance. The report and documentation of any resultant deficiencies should be completed within 30 working days and presented to the Management Sponsor. A typical report format has been provided as an attachment to this procedure. The report may be transmitted using a memorandum via email or hard copy.

Distribution for the report should be determined by the Management Sponsor. This may include the customer of the assessment (senior management as directed), management of the evaluated area, Director of Quality Services, E&I Audit Program Manager, applicable Quality Manager, Assessment Team, Legal, and additional distribution as requested. If required by Legal, the report will be marked as a privileged communication. The Legal Department will communicate the necessary restrictions.

6.5 Corrective Action

An item, condition (e.g. in-process corrective actions), or material that deviates from procedures, drawings, specifications, or other requirements and which can be readily corrected within the scope of such documents should be corrected and documented in the assessment report as an “in process corrective action.”

Items, conditions, or materials that cannot be readily corrected should be documented as a deficiency. The Responsible Manager is responsible for responding to the deficiency and for determining and implementing corrective actions.

Items that meet the criteria of a Corrective Action Request should be documented and processed in accordance with Procedure No. EIG-Q-008, “Corrective Action Requests.”

Items that meet the criteria of a nonconformance in accordance with Procedure No. EIG-Q-007, “Nonconformance Reporting,” should be handled in accordance with that procedure. Corrective actions shall be sufficient to correct the issue or nonconformance and shall be completed and documented in a timely manner.

Management of the assessed area is responsible for ensuring appropriate disposition and resolution of issues identified in the assessment report. Quality Services personnel may follow up to evaluate effectiveness of resolution of issues identified during assessments based on significance of issues identified or as directed by senior management.

Opportunities for Improvement identified during the assessment should be discussed with responsible management and the Management Sponsor. These items should be included in the assessment report.

6.6 Records

Records generated as a result of this procedure shall be retained in a Project or Central Filing System. Records to be maintained include the following:

- Assessment Notification
- Assessment Plan
- Assessment Report

- Checklists or annotated guidance documentation are required to be maintained only if needed as additional support for the report conclusions.

7. ATTACHMENTS

- Attachment 1, Management Assessment Process
- Attachment 2, Assessment Notification (typical format)
- Attachment 3, Assessment Report (typical format and content)

8. FORMS

- EIP-Q-014.01, Assessment Plan

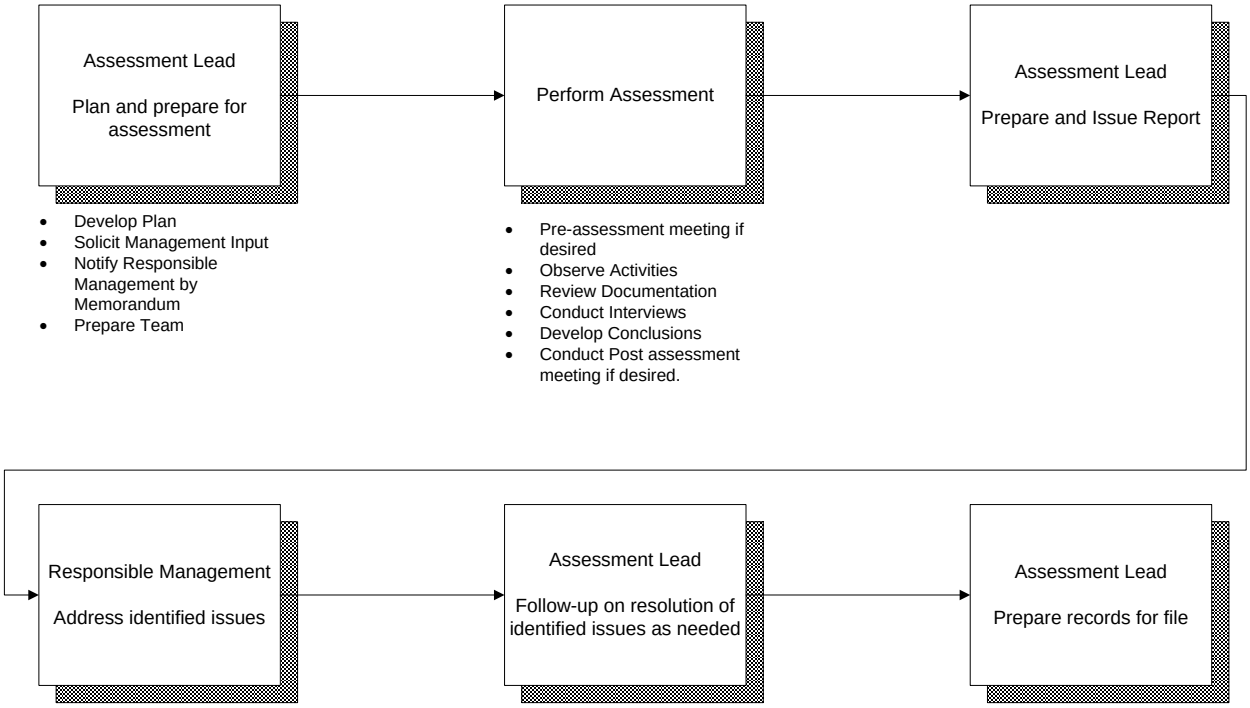
9. RECORDS

- EIP-Q-014.01, Assessment Plan
- Assessment Notification
- Assessment Report

10. REVISION HISTORY AND APPROVAL

Revision Level Revision Date	Revision Description	Responsible Manager
00 06/29/2011	Initial issue	Bryan Koehler
01 12/27/2011	Modified format only to align with Governance Management framework.	Bryan Koehler

Attachment 1
Management Assessment Process



Attachment 2
Assessment Notification (typical memo format; e-mail notification may be used)

To: (insert Responsible Management of Assessed Area)

From: (Insert Name), Assessment Team Lead

Date: (Insert Month, Day, Year)

RE: E&I Management Assessment, (Insert Number obtained from Audit Program Manager)

Shaw E&I Quality Services has scheduled an Assessment at the (insert Office Location or Project Title and Location) on (insert Month, date range, and year). There will be a pre-assessment entrance meeting on (Insert Month and day, and time). A close-out briefing is tentatively scheduled for (Insert Month and day, and time). Please provide this notification information to individuals in your organization that have not been included on distribution that should be made aware of the information.

The purpose of this assessment is to evaluate (insert purpose and reference to applicable client and E&I requirements). The scope will include: (Insert list of bulleted scope elements).

-

The assessment team consists of (Insert Assessment Team Lead, Title; Team Members, Titles, Technical Specialists, Titles).

A conference room should be made available for the team for the duration of the assessment. Key individuals knowledgeable of the core projects and business processes should be accessible; any schedule constraints should be communicated during the opening meeting so the assessment team may make the best use of the available time. Additionally, the request by the assessment team for records should be provided in a timely manner during the assessment, otherwise will not be considered available.

The results of the assessment will be summarized in a report within 30 working days after completion of the assessment.

The Assessment Team appreciates your cooperation in our collective commitment toward continual improvement. Should you have any questions, please contact me at (Insert Assessment Team Lead's phone number and email).

Cc: Responsible Management of Assessed Area (one organizational level above addressee)
Management Sponsor (Applicable Senior Management)
E&I Director of Quality Services
E&I Audit Program Manager
Legal Department (if applicable)
Assessment Team
Assessment File - Baton Rouge

Attachment 3
Assessment Report (typical format and content)

Cover Sheet:

Assessment Title

Organization/Location Evaluated

Assessment Number

Assessment Dates

Lead Assessor and Date

Report: (Include Table of Contents if desired for complex, lengthy reports)

Executive Summary

(Concise management level discussion of assessment purpose, scope, and overall results, both positive and negative).

Assessment Details:

I. Scope Element Evaluated

(Provide a brief discussion of methodology used to evaluate area and sufficient detail to support conclusions and issues identified. Include both positive and negative observations noted with supporting evidence/basis).

Summary of Issues/Improvement Opportunities

I. Issues:
(Include a table of individual deficiencies, referenced corrective action documentation number used to track disposition and resolution of the item).

Sequential Number	Identified Deficiency Description (Reference Requirement)	Corrective Action Document Number

II. Improvement Opportunities (OFIs)
(Include a table of individual opportunities for improvement – indicate whether function/location specific or whether applicable across E&I organizations).

Sequential Number	Description of Improvement Opportunity (OFI)

Attachments:

A. Assessment Team (List Lead, Team Member, and Technical Specialist as appropriate)

B. Personnel Contacted (List names of individuals contacted during the assessment, titles/organization/department, and role in assessment, e.g., pre-and post-assessment briefings, assessment performance, etc.)

C. Documents Reviewed (List documents reviewed, including title, revision, and/or date).

Management Assessment Plan

Assessment Number:	**Organization:**
Contract/Project Number:	**Location:**

Assessment Scope:

The purpose of this assessment is to evaluate (insert purpose and reference to relevant client and E&I requirements). The scope will nominally include: (insert bulleted scope elements to be assessed)

-
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ASSESSMENT PERSONNEL	**ASSESSMENT SCHEDULE**
Assessment Team Lead: Name, Title **Team Member:** Name, Title **Technical Specialist:** Name, Title	**Assessment Dates:** **Pre-Assessment Conference:** Date / Time **Post-Assessment Briefing:** Date / Time

Reference Documents:

Follow-up Items:	**Special Concerns/Items:**

TEAM ASSIGNMENTS

Lead (Insert Name):

Team Member (Insert Name):

Technical Specialist (Insert Name):

ASSESSMENT PLAN APPROVAL

Assessment Team Lead: **Date:**

1. PURPOSE

The purpose of this procedure is to establish the framework for conducting quality councils.

2. SCOPE

This procedure applies to corporate Quality Leadership Council for Shaw Environmental & Infrastructure Group (Shaw E&I) and any sub-tier quality councils.

3. REFERENCES

None

4. DEFINITIONS

None

5. RESPONSIBILITY

5.1 Procedure Responsibility

The Senior Director of EHS&Q is responsible for the issuance, revision, and maintenance of this procedure.

5.2 Action/Approval Responsibilities

5.2.1 Chairperson

The senior manager at the level of the council will be designated as the council chairperson and facilitate meetings consistent with the direction of this procedure.

5.2.2 Secretary

The senior Quality Services representative or chairperson designee in the absence of a Quality Services representative will be designated as the council secretary. The Secretary shall maintain records and help coordinate the meeting at the direction of the Chairperson, consistent with the direction of this procedure.

6. PROCEDURE

Quality councils are an integral part of Shaw E&I's Continual Improvement Program. A Corporate Leadership Quality Council is held by executive management, to include representation from operations and business management. Other quality councils are encouraged at other levels within the organization, as supported by responsible management (e.g., regional managers, office managers, project managers). Essential provisions of this procedure include the following:

- Quality Council Charter, Purpose, and Duties
- Organization
- Membership
- Subcommittees
- Quality Council Meetings

- Reporting Requirements

6.1 Quality Council Charter, Purpose, and Duties

The company quality policy states:

Shaw E&I is committed to consistently meeting client project objectives, requirements, and expectations. Our quality management system supports this endeavor by providing all employees with a framework to plan, perform, monitor, and improve work performance and results. We strive to develop and implement processes that enable timely identification and prevention of nonconforming performance and results. Shaw E&I leaders recognize project teams and individuals who deliver cost effective solutions that help our clients meet their project objectives.

Quality councils help to fulfill this policy by providing a mechanism for management and employees to take a proactive role in providing an atmosphere for continual improvement.

6.1.1 Charter

The charter of each quality council is to promote continual improvement through the Quality Management System at the management level of the council, within the quality policy, procedures, and guidelines of the company. Each quality council is chartered to act within the bounds of the authority approved for that management level.

6.1.2 Purpose

The purpose of each quality council is to create an environment that actively involves management and employees in the continual improvement process to improve work performance and results for both internal and external customers.

6.1.3 Duties

It is expected that the duties of each quality council will evolve to meet the needs of the management level that it serves. A list of key quality council duties is provided below:

- Monitor the activities of any lower level councils.
- Coordinate and monitor quality assurance inspections, surveillances, audits, and assessments.
- Verify that nonconformances are resolved in a timely manner through corrective and preventive actions.
- Facilitate the awareness and implementation of the Quality Management System.

6.2 Organization

Quality councils should function at various management levels across the company, including corporate, business line, and division levels. Quality councils serving large business lines may, at their discretion, create program or project safety councils.

Quality councils at all levels are empowered with the authority to act through the membership and participation of the senior manager at the level of the council (e.g., President at corporate level, business line manager at business line level). Authority to act includes the management authorities stated in various company procedures for the management level responsible for the safety council.

6.3 Membership

Each quality council should have a chairperson and secretary. The senior manager at the level of the council will be designated as the council chairperson. The senior Quality Services representative at the level of the council should be the secretary. In the absence of a Quality Services representative at a particular council location, the chairperson will appoint a secretary who is knowledgeable in company Quality Management System requirements.

Total membership of each quality council should be limited to approximately eight people and should be equally divided between management and other employees. It is the responsibility of the chairperson to provide a quality council membership that represents a cross section of the employees within the council's responsibility. It is important that quality council members be knowledgeable of operations within the organization represented by the council so that employees can communicate potential problems and ideas for improvement to members of the quality council.

Quality council members are expected to serve at least a 1-year term before rotating. The position of a chairperson does not rotate and remains the senior manager of the council level. The secretary does not rotate unless there are multiple Quality Service representatives at the level of the council.

6.4 Subcommittees

Much of the work of each quality council can be accomplished by subcommittees. Each subcommittee will have as its chairperson a member of the quality council appointed by the council chairperson. Subcommittee membership should have representation between management and other employees so that the necessary authority and influence exist to act upon recommendations for improvement, solve potential problems, and provide solutions to the quality council.

6.5 Quality Council Meetings

Quality council meetings should be held at least bi-monthly, preferably as part of a regularly scheduled management meeting. It is estimated that approximately 30 minutes to 1 hour will be required for the conductance of a quality council meeting.

6.5.1 Agenda

The agenda for each quality council meeting should be documented. The following topics may be considered:

- Client performance feedback
- Performance objectives and goals, and performance metrics
- Suitability, adequacy, and effectiveness of the Environmental Management System
- Training, awareness, and competence
- Continual improvement initiatives
- Results of surveillances, audits, and management assessments
- Nonconformance, corrective, and preventive actions
- Current and planned work controls (e.g., procedures, equipment, trained personnel)
- Inefficient, wasteful, or non-value-added work processes

- Preventive action and corrective action taken since the last quality council meeting
- Report of activity and findings since the previous quality council meeting from any subcommittee chairperson, including progress on action items
- Status of Wildly Important Goal (WIG) progress

6.5.2 General Rules of Operation

The general rules of operation are listed below:

- Quality council and committee members participate on company time.
- Quality council meetings are open to all employees.
- Quality councils are encouraged to operate by consensus. When a vote is needed, a simple majority with one vote per member shall prevail.
- The chairperson of the quality council may not overrule a decision of the quality council. The chairperson may refer an issue to a higher level council prior to action, or for resolution, as appropriate.
- Quality councils must operate within their level of assigned management authority.
- Spending authority is limited to that of the quality council chairperson.
- Quality councils may not change company policy and procedures or guidelines established by a higher level quality council; however, quality councils may recommend revisions to policy, procedures, or guidelines.
- Work rules cannot be set beyond the authority of the quality council.
- Quality council members are to seek employee input regarding value-added continual improvement opportunities. Also activities with heightened levels of operational risk without (or ineffective) controls.

6.6 Reporting Requirements

Each quality council is required to prepare meeting minutes to summarize the council's activities. This report is to be prepared by the secretary and maintained. Minutes should be distributed to interested parties, at the discretion of the chairperson.

7. ATTACHMENTS

None

8. FORMS

None

9. RECORDS

None

10. REVISION HISTORY

Revision Level Revision Date	Revision Description	Responsible Manager
0	Initial issue. Content based on HS018, Safety Councils.	Andrew Johnson

Uncontrolled when printed: Verify latest version on ShawNet/Governance

Revision Level Revision Date	Revision Description	Responsible Manager
02/07/2012		