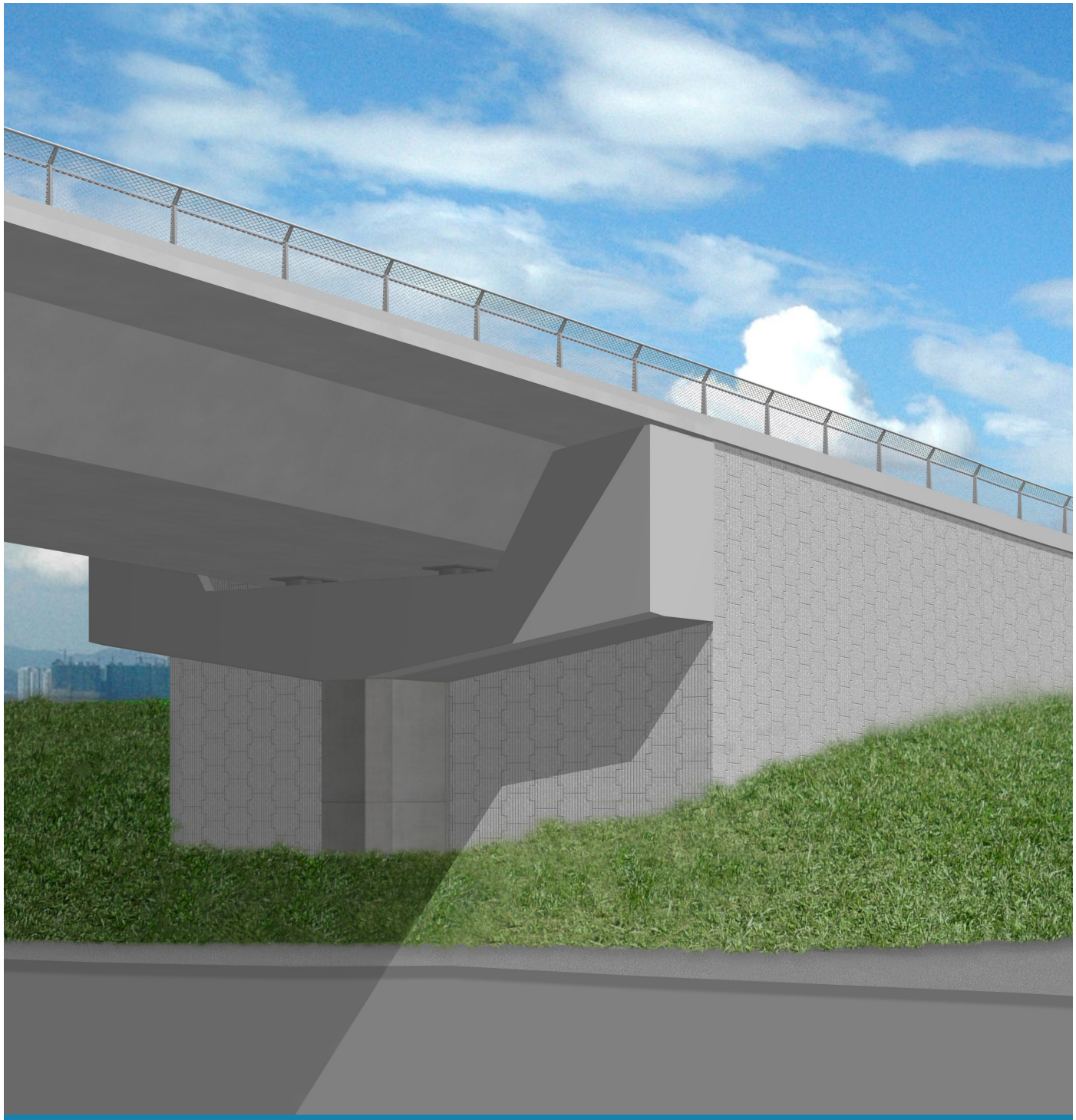

1.2

Quality Management Plan

1.2 Quality Management Plan

RFP ITP Appendix B § 1.2; D § 1.1.2

1.2.1 Overview

1.2.1.1 Quality Approach

The SFI Team's Policy commits the resources required to effectively implement and maintain, the Quality Management Plan (QMP) and to continually improve its effectiveness. FCC, Impregilo and Arup each has ISO 9001 certification of their Quality Management Programs, and these Quality Programs, along with the Port's Quality Manual Template (Exhibit 2-2-A), form the basis of this QMP.

The SFI joint venture will have full responsibility for the overall quality assurance and quality control for both the design and construction elements. This will include managing the quality of the Work and materials by designers, subcontractors, fabricators, suppliers, vendors, and all other entities involved with the design and construction elements of the Project.

SFI will ensure that the QMP meets or exceeds the requirements of the contract documents. The implementation and enforcement of the procedures, inspections, and controls of the QMP have the unconditional support of SFI's project management team and the Executive Management Committee. The Quality Manager, who reports directly to the Executive Management Committee, will be responsible for the implementation of the QMP. SFI will support the Quality Manager with all the necessary resources to ensure a high-quality Project.

The Executive Management Committee has committed to establishing a strong Quality Management Policy, including quality objectives, communicating the importance of meeting regulatory requirements, conducting project quality reviews on a quarterly basis, providing resources to meet project quality requirements and continually improving the work process and deliverables.

1.2.1.2 Quality Management Goals

SFI's quality management goals will result in quality products and services that meet or exceed the requirements of the Port ("Owner"), as well as those of Caltrans and FHWA. Excellent quality will be obtained through appropriate planning and control of work operations and through a comprehensive quality control process that will provide the right level of resources to review work plans and procedures, check materials and physical conditions of adjoining and adjacent work items, plan and perform inspections and testing, and quality surveillance/auditing.

SFI Advantages

- Extensive risk management experience on large infrastructure projects.
- Potential savings on Builders Risk Policy premium.
- Reduced risks on schedule, environment, quality, and safety.

SFI will monitor its performance against the quality goals and continuously look for ways to improve the quality process.

In addition to the focus on project quality, the QMP will also be coordinated with SFI's design and construction activities to promote safety, with minimal impact to traffic flow, on schedule, and within budget.

In accordance with the requirements of the contract documents, the QMP will be implemented with focus on the following objectives:

- Implementing a well-designed quality program and continually improving all aspects of the process as the Project progresses.
- Establishing a Quality Partnering Charter committed to team values of honesty, quality, pride, professionalism, integrity and listening to successfully achieve the quality goals.
- Partnering with the Port to make the design, construction, and management processes open to inspection and oversight.
- Demonstrating our commitment to quality throughout the design and construction of the Project.
- Effectively communicating the QMP to all

members of the design and construction team, so that the QMP is implemented as part of the triangle with schedule and budget.

- Basing decisions on factual information gathered in a manner that is open to inspection to prevent undue influence of personnel tasked with meeting schedule and budget goals, potentially at the expense of quality.
- Empowering quality personnel through support from upper management and from clear definition and communication of quality roles.
- Bringing subcontractors and suppliers to the team who are as committed to providing a superior end product and meeting the project quality requirements.
- Implementing improved electronic document and data management that is accessible to the Port and that continues effectively from the design through construction phases.

1.2.1.3 Continual Improvement

Continual improvement will require the commitment of all of the SFI project staff. SFI management will work to create a culture that encourages people to actively seek opportunities for improvement of performance in processes, activities, and quality of products.

Authority will be effectively delegated so that project staff are empowered and accept responsibility to identify opportunities where the design and construction teams can improve their performance.

SFI will create this job culture by recognizing achievements in the area of quality improvements. Improvement opportunities and suggestions will be sought on an ongoing basis. Review and evaluation of suggestions will be timely and as thorough as necessary. Improvement plans will be based upon review of all available or necessary data and implementation will be efficient and effective.

1.2.1.4 Approach

The QMP that will be implemented for this Project will encompass the policies, program, organizational responsibilities, procedures, and means of ensuring that all disciplines, aspects, and elements of the Work complies with the requirements of the Contract Document. The QMP will also ensure that all materials incorporated into the Work will perform satisfactorily for the purpose intended.

The approach of the QMP will be to outline a strict set of requirements for ensuring the work is properly planned and checked. This process will focus more on the initial steps before the actual construction of the Work. This includes quality reviews during design of the Project, preparation of detailed work plans prior to each of the significant construction operations, review of all necessary details to perform each operation, and ensuring all controls are in place to verify work is compliant.

Quality management will be handled through a series of steps that will include the following:

- **Preparatory** – At this step, the upcoming sequence of definable work will be evaluated by the effected parties. The work items will be reviewed to ensure all submittals, materials, personnel, and plans are in place to properly perform the Work.
- **Preliminary** – At this step, the necessary parties will be brought back together to review that all items identified during the Preparatory step have been completed and are ready for the work to proceed.
- **Production** – Activities preceding this step will have met all of the requirements of the Preparatory and Preliminary steps. Work will be underway and all quality processes will be fully employed.

The QMP will describe the processes, procedures and details of reviews and checks that will be performed on the design of the Project components. The QMP will also outline the inspections and tests that will be performed on construction materials and workmanship to ensure the overall quality of the constructed project.

The QMP will meet the Port's directives and requirements, provide independent confirmation that Project deliverables satisfy specific Contract requirements, and promote a seamless, transparent interface with the Port, allowing the Port's staff to observe all deliverables for the Project as they are developed.

The QMP will not be revised without prior written approval from the Port. However, the QMP is a living document, subject to ongoing review and revision to better meet the needs of the interested parties over the life of the Project. Revisions to improve the quality procedures and processes are expected and will promote the ability to meet Project requirements.

Quality is assured by assigning full-time, dedicated, and competent staff to perform the quality functions of inspection, testing, surveillance, training, and auditing of quality processes and procedures used during the design and construction work.

1.2.1.5 Design and Construction Quality Management

Quality Control (QC)

Under direction of the Quality Manager, the Design Quality Manager (DQM) and Construction Quality Manager (CQM) shall implement the quality processes and procedures for their respective areas of responsibility. Quality control shall include reviews, checks, tests, and inspections of the work processes, procedures, inputs, and outputs.

Quality control is a continuous process that cannot be excluded from any part of the design or construction activities that are performed.

Quality control will be performed through mechanisms such as Inspection and Test Plans, internal plan and process reviews, factory inspections, and audits.

1.2.1.6 Quality Assurance (QA)

Quality assurance is an additional process above the quality control processes. The quality assurance process ensures that project quality control is functioning correctly and has been properly implemented for all aspects of the work from design to construction.

1.2.1.7 Document Control

Document control shall follow specific procedures to be used for the review, distribution, processing, and filing of documents generated for the Project. These procedures will include a Project specific numbering system, a distribution/routing plan, and procedures for archiving documents.

Documents shall be controlled by the document control staff. The document control staff will include project engineers, administrative assistants, and clerical office personnel.

The Quality Manager shall verify that the procedures for document control are maintained through auditing the document control system on a periodic basis.

1.2.1.8 Design Management

The Design team will perform QA/QC during the design process in accordance with the project QMP. They will perform QA/QC functions with a comprehensive and systematic examination of the design documents. They will evaluate the design requirements and provide a design to meet those requirements, and identify problems and propose solutions. The components of the design shall consist of drawings, specifications, and calculations.

All technical documents developed by the design engineer, contractor, or subcontractor shall bear the stamp of a Professional Engineer registered in the State of California where required.

The Design Manager will direct the overall design development and review the Detail Design Drawings and Specifications through all phases of the design and will be familiar with all aspects of the Detail Design Drawings and Specifications. The Design Manager will review these documents for general conformance to the Contract Documents. All deficiencies will be corrected promptly. Deficiencies found during review of the design components and the corresponding corrections shall be properly documented with the associated correction.

The Design Manager will document these findings during review of the design components. Documents will be available for audit by SFI and Port representatives.

1.2.1.9 Organization Roles & Responsibilities

RFP ITP Appendix B § 1.2(b); D § 1.1.2

The quality management team will consist of a Quality Manager (QM), a DQM, a CQM, Quality Reviewers, Quality Inspectors, sampling and

testing personnel and an Independent Testing Laboratory. The staffing levels will be adjusted on an as needed basis depending on the work being accomplished on each day, so that all work will be reviewed, inspected and tested according to the QMP.

Work will not be permitted to proceed without the proper level of Quality Organization (QO) personnel to inspect and test the materials and workmanship during construction.

The QO will be comprised of Quality Control and Quality Assurance staff. SFI's Executive Management Committee is committed to assigning personnel in the QO with the necessary qualifications, training, and experience.

The QO operates under the oversight of the Quality Manager, who reports directly to the Executive Management Committee. The DQM directs design quality. Construction quality is under the direction of the CQM. These two individuals will report directly to the QM, limiting the influence of schedule, performance, and cost on project quality requirements.

The QO will provide the QC procedures and QA review, testing, and inspections necessary to ensure the project quality meets contract requirements and the Executive Management Committee's Quality Management Policy.

Quality Organization Key Positions and Qualifications

Personnel assigned to perform quality inspection, testing, or monitoring of characteristics for acceptance shall not be those performing or directly supervising the Work being reviewed. The QM and the Quality staff shall have no responsibilities in the production of the design or construction of the Work.

Material Testing/Inspection staff and Material Testing labs are required to possess the necessary technical industry certifications and the Port certifications for the Work they are inspecting or material they are testing as discussed below.

All QO personnel shall have the minimum qualifications and duties listed below:

Piyush Mehta—Quality Manager

Responsible for the overall quality activities:

- Mr. Mehta will report directly to SFI's Executive Management Committee and produce a monthly report specifically for the Committee's review.
- Mr. Mehta will have no responsibilities in the production of the Work.
- Mr. Mehta has more than 15 years of quality management experience on complex infrastructure projects, including nine years of experience on large urban freeways (SR-241/SR-261) and transit design-build projects (Orange Line BRT).

Dan Devlin, P.E.—Design Quality Manager

Responsible for quality activities related to the design:

- Mr. Devlin will report directly to the Quality Manager and will have no responsibilities in the production of the Work. Mr. Devlin will provide the same role as the Design Quality Assurance Manager in Quality Manual Template's Exhibit 2-2-A.
- Mr. Devlin has 28 years experience in the design and engineering of transportation structures, has 18 years experience as lead designer responsible for transportation projects similar in scope to the Project.
- Mr. Devlin will audit the design documents to verify that the inter-discipline design reviews, independent technical reviews and constructability reviews have been fully completed.

Scott Beyma, P.E.—Construction Quality Manager

Responsible for quality activities related to the construction of the Project:

- Mr. Beyma will report directly to the Quality Manager and shall have no responsibilities in the production of the Work. Mr. Beyma shall provide the same role as the Construction Quality Assurance Manager in the Quality Manual Template's Exhibit 2-2-A.
- Mr. Beyma has more than 15 years of management experience on complex infrastructure projects, which includes five years of experience on urban freeway and design-build highway projects (SR-241/SR-261 and Orange Line BRT).

- Mr. Beyma is licensed as a Professional Engineer in the State of California.
- Mr. Beyma will ensure that all quality control inspections and lab tests are independently completed.

Critical Activity Points Manager

Responsible for all critical activity point inspections and testing before moving on to the next element of construction:

- The Critical Activity Points Manager will be a licensed Professional Engineer in the State of California and have the applicable Caltrans technical certifications for the Work performed under the Critical Activity Points.
- The Critical Activity Points Manager may add other critical activity point inspectors as required by the construction schedule.

Configuration Manager

Responsible for collection and distribution of all released-for-construction plans, approved shop drawings, approved requests for information with changes to plans and approved specifications:

- The Configuration Manager will report directly to the Quality Manager
- The Configuration Manager will coordinate with the Document Control Manager for distribution of documents
- The Configuration Manager will keep a hard copy of all approved documents and keep the electronic document control web site up-to-date.

Quality Testing Supervisor

Responsible for overseeing all materials testing:

- The Quality Testing Supervisor will report directly to the Construction Quality Manager.
- The Quality Testing Supervisor will coordinate all off-site and source manufacturing testing for the Materials Control Schedule.
- The Quality Testing Supervisor will have sufficient experience and education to perform the quality inspections related to the work. This will include possessing a college degree in a closely related field or certification by recognized certifying agencies such as ACI, ICC, NICET, or Caltrans.

Quality Inspectors

Responsible for the inspection and testing of the construction work and supervising quality testing:

- Quality Inspectors will report directly to the Construction Quality Manager.
- Quality Inspectors will have no responsibilities in the production of the Work.
- Quality Inspectors will have separate areas of expertise for drainage/utilities, structural concrete, structural steel, electrical, and traffic/roadway.
- Quality Inspectors will have sufficient experience and education to perform the quality inspections related to the work. This will include possessing a college degree in a closely related field or certification by recognized certifying agencies such as ACI, ICC, NICET, or Caltrans.

Quality Testing Technicians

Responsible for the testing of materials and workmanship to verify quality:

- The Quality Testing Technicians will report directly to the appropriate Quality Inspector.
- The Quality Testing Technicians will have no responsibilities in the production of the Work.
- The Quality Testing Technicians will have sufficient experience and education to perform the required quality testing during construction of the work. Quality Testing Technicians will have appropriate certification by recognized certifying agencies such as ACI, ICC, NICET, or Caltrans.

Quality Personnel Resumes

We have not included resumes for inspectors at this point. We will subcontract with UDBE/DBE firms after contract award and scope has been determined.

QUALITY ORGANIZATION'S AUTHORITY TO STOP WORK

It is important to note that the key quality staff listed above has sufficient authority and organizational freedom to identify quality problems and to initiate, recommend, provide, and verify

implementation of the solutions. The QO staff does not report to and is not under the authority of any design or construction staff that is engaged in production of the Work. The QO has full authority to stop work if quality is being compromised. Even though the QO will not be influenced by any potential impact of implementation on the project schedule or budget, the QO shall be cognizant of the construction team's need to anticipate these issues and facilitate schedules, maintain budget, and improve organization delivery performance.

Design Quality Organization Charts

RFP ITP Appendix B § 1.2(a)

The Design QA/QC **organization chart** and **resumes** for key QA/QC personnel are included at the end of this subsection.

The Design Quality Manager will oversee Design Quality Assurance Engineers who will verify that the various design checks are completed.

Construction Quality Organization Charts

RFP ITP Appendix B § 1.2(a); B § 1.2(b); D § 1.1.2

The Construction QA/QC **organization chart** and **resumes** for key QA/QC personnel are included at the end of this subsection.

The Construction Quality Manager will oversee all construction quality assurance activities. Reporting to the Construction Quality Manager are the Quality Testing Supervisor, the Structural Concrete Lead Inspector, the Structural Steel Lead Inspector, Drainage/Utility Inspector, Electrical Inspector, Roadway/Traffic Inspector and the Quality Testing Supervisor. We will add technicians as needed to conduct tests with the independent lab.

1.2.1.10 Procurement

The Discipline Engineers under the direction of the superintendents will have the responsibility for procurement of all permanent materials and equipment. This responsibility includes ordering, receiving, and storage. Permanent materials and equipment documentation will be submitted to the Port as required by the Contract Documents. Only those suppliers who are able to meet the requirements of the Contract and Design Documents will be utilized to furnish such materials and equipment.

The Discipline Engineers will ensure copies of all transmittal letters relating to approval of material or equipment are properly filed. SFI will maintain a record of suppliers used to furnish approved permanent materials and equipment as necessary.

The purchase of permanent materials incorporated into the work will be performed through the use of procurement documents. These documents will be in the form of purchase agreements or purchase orders as appropriate. These documents will include information either directly or by reference as to the following: specification section, item description, quantity, required documentation, technical requirements, material standards, quality assurance, quality control requirements, dimensions when applicable, packaging specifics, and date required.

1.2.1.11 Subcontractors

Subcontractors and suppliers will be required to submit their respective Quality Management Plans to SFI for review or adopt the QMP as their own. In general, suppliers will be required to furnish material certificates, product data, installation instructions, warranties, personnel qualifications, and results of independent laboratory tests. Subcontractors will be required to adhere to all applicable aspects of the QMP relating to their work and may also furnish supplemental personnel to perform various field tests, inspections, and documentation.

The Quality Manager will work with subcontractors and suppliers regarding their quality control activities. Each subcontractor will receive quality training and quality indoctrination on procedures before they are allowed to start work. Throughout the duration of the Project, we will hold quarterly quality meetings with all subcontractors to go over current procedures, critical activity inspections, scheduling of inspections and testing and any other issues related to subcontractors' work quality.

The Quality Manager will work with the Construction Manager and the subcontractors and suppliers to ensure they follow the quality requirements of the Contract Documents.

1.2.1.12 Inspection

Testing and inspection of work and materials shall be performed in accordance with the

Project's quality management procedures and per the Contract Documents. Specific testing and inspections shall be detailed in the individual Inspection and Test Plans that are developed for each definable feature of work.

Testing and inspection will include Factory Tests, Quality Control Inspections, Installation Verification Tests, and Acceptance Tests.

Quality Control inspections are performed by the full-time quality control staff and will confirm that materials and equipment, installation, and workmanship meet the requirements of the Project.

Installation verification tests will be performed to ensure work meets the requirements of the specifications. This can include tests on partial sections of a system to verify each part of the system is compliant before final completion testing.

Acceptance tests are performed on-site and shall be complete before any ITS system integration tests are done.

1.2.1.13 Testing & Independent Laboratories

The Quality Manager, Construction Quality Manager and the Quality Testing Supervisor will write a Materials Control Schedule (MCS) that outlines the roles and responsibilities for sampling and testing of materials. The MCS will cover sampling and testing that will be performed by SFI and the Port. The MCS will assure and verify that all materials, equipment, and elements of the Work will perform satisfactorily and meet the requirements of the contract documents.

Special attention will be given to the role of off-site testing at the source and fabrication facilities to assure that tests and certifications are completed before material is delivered to the site.

SFI will use an independent testing lab to perform shop and field inspections and material testing as needed or required by the Contract Documents. The independent testing lab will not be owned by or affiliated with SFI or its partners. The independent testing lab will provide services for ensuring calibration of field testing equipment, checking the results of field-testing, and reports presenting the results of inspections and tests.

The Construction Quality Manager will oversee the activities of the testing lab on the Project site. Testing technicians and Special Inspectors provided by the independent testing lab will be scheduled on an as-needed basis.

The qualifications of the independent testing lab, resumes of the agency's managing engineer, other professional engineers on staff, and the certified field and laboratory testing technicians to be used will be provided before the start of work. The Quality Manager will select the independent testing lab and will submit its credentials to the Port.

The independent testing lab will:

- Have the proper AASHTO accreditation, credentials, certifications and experience to perform inspection and testing as required.
- Have accreditation by r the California Council of Testing and Inspection Agencies, State of California, Department of General Services, Laboratory Evaluation and Acceptance Program.
- Have AASHTO accreditation in ASTM C1077-92, "Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation," ASTM D3740, "Practice for Evaluation of Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design/Construction," and ASTM D3740, "Specifications for Minimum Requirements for Agencies Testing and Inspecting Bituminous Paving Materials."
- Have a sufficient number of inspectors and technicians appropriately certified for the work they will be inspecting and testing.
- Have an accredited and certified facility located near the Project.
- Confirm that specified verifications, sampling and testing of materials are in accordance with the standards governing the different sections of the Contract.
- Immediately inform the Quality Manager upon verification, sampling, testing of any materials (supplied or furnished) or work performed by SFI or our subcontractors, per the specified requirements, if it does not fully meet the Project specifications.

- Ensure test reports are submitted to the Quality Manager within two working days after each test is complete.

1.2.1.14 Coordination with the Port

The QM will be responsible for coordinating the QMP with the Port. The QM will maintain continual communications with the Port on all matters of Project quality.

The QM will coordinate all testing, inspection, and observation with the Port to satisfy the requirements of the QMP.

1.2.1.15 QMP Inspection and Test Procedures

The QMP procedures will be established based on the final design of the Project. Each QMP procedure shall follow a predetermined format. Each procedure may be written to include additional items as needed to ensure quality is properly maintained. The predetermined format includes the following items:

1. Scope
2. References
3. Assignment of Quality Personnel
4. Inspection Procedures
5. Testing Requirements
6. Quality Criteria
7. Quality Documentation
8. Special Equipment
9. Required Certifications

1.2.2 Quality Manual

A Quality Manual will detail all of the quality requirements and procedures of the QMP for the design and construction of the Project. The Quality Manual will be approved and endorsed by SFI's Executive Management Committee before implementation.

The Quality Manual will be maintained by the Quality Manager, who will review and update the manual at least every three months as necessary, based on the discussion and findings of quality management meetings. The Quality Manual is considered a living document and is subject to revision as necessary to facilitate and improve the quality process for the Project. The QM will prepare the Quality Manual in accordance with Caltrans's four volume template that has been provided by the Port.

1.2.2.1 Management QMP Review

The QMP will be reviewed quarterly throughout the life of the Project for the express purpose of assessing the suitability, adequacy, and effectiveness of the program. The Port shall be invited to participate in the reviews.

1.2.2.2 Quality Manual—Design

The design section of the Quality Manual will include the required quality program procedures to ensure the design is properly planned and meets the contract requirements. The design section of the quality manual will incorporate the following items into the quality procedures:

1. Quality will be achieved through accurate planning, coordination, supervision, and technical direction; proper definition of job requirements and procedures; and the use of appropriately skilled personnel performing their work functions with care. Quality procedures define the planning that achieves its quality goals through a transparent process of open communication, trust, and a partnering atmosphere that addresses concerns promptly, before they become problems.
2. The design team will prepare the design documents at Conceptual, Intermediate, Full and Release-For-Construction (RFC) phases for review to ensure the design progresses correctly, using the established design criteria for the Project and appropriate inter-discipline and Task Force coordination (via regular scheduled meetings, written communications, etc.). Task Forces (which include representatives from SFI, the Port, and local agencies as needed) meet as agreed upon during the design phase and periodically thereafter. Some task forces may be added, combined, or eliminated as design progresses. The Task Forces will generally be discipline-specific.
3. All design documents will be subjected to an inter-discipline design checking process. For design documents where inter-discipline design checks are warranted, an Inter-Discipline Design Review (IDR) is performed. All documents that affect construc-

tion activities are subjected to a Constructability Review. Before delivery to the Port, all design documents shall be subject to the Independent Technical Review. The design documents will be reviewed using the appropriate forms as required.

4. Checker corrections and comments and review comments will be evaluated and incorporated into the documents by the design team as appropriate.
5. The design team will prepare the RFC documents and will submit the RFC package to the DQM. The DQM audits and certifies the documents, indicating that the documents are approved for release.
6. The DM will transmit the signed and sealed RFC Documents to Document Control along with the DQM's certification that the design package may be released for construction. The documents are then distributed.

Design QA/QC System

The Quality Manual will address internal engineering and subconsultant organizations' roles and responsibilities, reporting authority, interfacing responsibility, engineering processes, and quality control measures necessary to verify that design documents are developed and issued in accordance with the contract requirements and execution procedures. Design quality control will be implemented from preliminary engineering through design development and approval for construction. The design team, including design subconsultants, will be responsible for implementing design quality requirements through design, requests for information (RFIs), and disposition of nonconformance reports. Design quality assurance will be performed through parallel but independent oversight of the quality control implementation throughout the design process.

The Design QA/QC process of the Quality Manual will contain the following program elements: design planning, design input, design change, technical checking, verification of design output (reports, calculations, plans, etc.), internal audits and oversight, and document control, distribution and records management.

Design Quality Control

The Team's design review will be performed at scheduled review points of Conceptual, Intermediate, Full and RFC completion. Each of these design review milestones is crucial to the efficient production towards the next milestone. These thorough reviews will enable the design to proceed with higher efficiency towards an acceptable design with no repeat work. The overall design review elements are:

- Criteria Review
- Design Validation Reviews
- Internal Design Review
- Interdisciplinary Review
- Constructability Review
- As-built Review
- Quality Record Review

The quality control check will review, at a minimum, the following:

- Design assumptions and design criteria.
- Analysis assumptions, modeling, and results.
- Design calculations and criteria compliance.
- Drawing coordination with other disciplines.
- Drawing consistency with calculations.
- Drawing consistency; plans and details.
- Drawing and specifications; coordination, completeness, clarity and constructability.

An Independent Structural Design Team will perform a check of all structural design elements between the Intermediate and Full submittals including the preparation of an independent set of calculations. The plans and details will be carefully checked by this independent team. The Independent Structural Design Team will then check the special provisions and compare them with the plans. The independent review will verify that input from all design-build team members has been incorporated and coordinated.

Design team internal quality control reviews will be coupled with inter-discipline, independent technical and constructability reviews incorporating the skills of the full design-build team to meet all of the QMP objectives.

Inter-Discipline Design Reviews: These reviews are accomplished by routing the design documents of one discipline to all other disciplines for review and comment.

Independent Technical Reviews: The technical

expertise of senior staff of the project team is added to the design through this review. These reviewers are chosen for their extensive background and experience on similar projects. Reviewers are not involved directly in the project design; their reviews focus on assuring that the design uses the best technology and methodology available.

Constructability Reviews: The experience and expertise of the Construction Manager and the construction team is incorporated into the design through these reviews. At each scheduled review point, the constructability review provides comments to the Design Manager.

The design team will conduct interdisciplinary, independent technical reviews, constructability and formal quality reviews before every submittal milestone. The review comments will be documented and tracked for incorporation and/or responses. Meetings will be conducted to resolve and reach agreement on comment incorporation in a timely manner. Documentation of these meetings, redlined plans with comments, and the comment responses matrices will all become part of the quality records for the Project, to track changes during design progression.

Design Quality Assurance

Design quality assurance involves verifying that all the elements of the QMP are applied to design activities to ensure accurate tracking and development of design, expediting approvals for RFC documents, and ultimately, final design acceptance. These QA activities include the procedures for use in the completion of design documents—calculations, reports, plans, and specifications.

At the Project outset, training sessions will be conducted by the Design Quality Manager for the entire design team to ensure that the required procedures and processes are explained consistently to all team members.

The Design Quality Manager will verify that Design Review corrections and comments are addressed and documented by the Design Manager at each scheduled review point.

Design QA/QC Integration

The Design Manager will conduct regular design meetings with Port representatives and representatives of the Project design leads and design subcontractors to track the progress and content of the design. Specifically, these meetings will address design interfaces, progress, schedule, design quality, system safety, mandatory formats, quality assurance and code compliance. All drawings and supporting calculations will be required to follow the document control process and be submitted in the format specified by the Project scope.

SFI's Executive Management Committee has overall responsibility for all systems integration irrespective of who is providing the design or construction effort. The appropriate design and construction organizations will review parallel efforts of engineering design work of subconsultant's facilities, as well as the design documentation, functional definition, and specification of the systems elements. During the design phase, the Design Quality Manager will conduct oversight of integrated quality control. The subconsultant work will be reviewed, and an Interface Report will be prepared that details any interface issues that need resolution.

1.2.2.3 Quality Manual – Construction

The construction section of the Quality Manual shall provide the quality requirements for the construction phase of Work. The construction section of the Quality Manual will incorporate the following items into the quality procedures:

1. The protocol for encouraging and striving for continuous improvement of construction processes, methods, materials, and workmanship.
2. Training and continuing education of the SFI construction and quality staff regarding their role in assuring quality on the Project.
3. Development of construction work plans to ensure that each individual work element is properly planned. The QO will develop Inspection and Test Plans that will be integrated with the construction work plans. To show compliance with the Port's requirements, workers will be directed to identify quality problems during design and construction, and to show improvement during the design and construction process.
4. Procedures for ensuring subcontractors and

suppliers meet the requirements set forth by SFI in their work and all materials supplied for the project. Subcontractors and suppliers will be required to provide quality control plans that will be reviewed and incorporated with SFI's program.

5. Procedures that require complete and transparent communication with the Port. This means that all testing and inspection results will be provided. It is SFI's intent to work side by side with the Port to ensure all work and materials are of superior quality and that any improvements that can be made will be done.

1.2.2.4 Construction Work Plans

SFI will prepare Construction Work Plans (CWP) for all major individual Work elements such as placement of cast-in-place concrete, construction of deep foundations, stressing of cables, and erection of structural steel members. The CWPs are presented and discussed among the design and construction teams and the QO before the start of the individual Work element. The subject Work may not proceed until the CWP is approved by all parties.

Please see Section 1.1.3 "Construction Management Plan," for more details.

1.2.2.5 Inspection and Test Plan

Quality Control and Quality Assurance Inspections will be performed on all Work to ensure compliance with the contract documents. All Work will be subject to continuous inspection during all work shifts and for off-site work activities as needed. Assignment of inspection personnel will be consistent with the level of activity and complexity of work to be performed. QC inspections shall be done by individuals other than those responsible for performing the Work. Work activities subject to inspection include but are not limited to material and equipment receiving, in-process and final construction activities, in-process tests, qualification tests, equipment installation and tests, and system integration testing and acceptance.

Sufficient inspection points shall be implemented to verify all Work is in accordance with contract documents. Inspections shall be conducted in accordance with prepared Quality Control and Quality Assurance Inspection instructions and inspection frequency checklists. Work shall not proceed without inspection instructions and checklists in place for the specific work element.

Inspection planning shall be prepared in concert with the construction schedule and shall include identification of prerequisite requirements. These may include approved submittals, material certifications, verification of personnel, certifications for special processes, equipment calibration verification, applicable inspection instructions and checklists, and the number of inspectors required.

Each inspector shall document the results of daily inspections and surveillances on daily inspection reports that include the applicable quality inspection checklists. All inspection documents shall be maintained on the job-site as quality records and will be available to the Port upon request.

Inspection personnel shall have sufficient organizational freedom to identify and report nonconforming conditions and have sufficient training, knowledge and experience to perform specific inspections.

Quality Control inspection efforts on all items of work shall meet or exceed the Port's expected inspection levels as shown on inspection frequency checklists.

A Stop Work notification will be issued if there is evidence that the QMP or work procedures are not being followed, or if the materials or workmanship do not meet the contract requirements. The notification will remain in effect until appropriate quality procedures have been established and implemented.

1.2.2.6 Control of Special Processes and Job Control Testing

Special processes and job control testing associated with hardware fabrication or construction shall conform to applicable Government Rules and Standards, Industry Standards and the Port contract requirements. Examples of special processes and job control tests may include, but

are not limited to:

- Special Processes
  - Welding
  - Non-destructive Testing
  - Coatings
  - Painting
  - Piling
  - Cable Tensioning
- Job Control Testing
  - Concrete
  - Corrosion Control
  - Soils
  - Asphalt
  - Waterproofing
  - Drilling
  - Layout Control

Inspection and test laboratories performing special processes or job control testing shall have appropriate certification that is current and issued by a recognized regulatory agency. The laboratory shall be reviewed and approved by the Port before Work starts. Special process inspections and tests shall be accomplished by qualified technicians, certified inspectors or other qualified or certified individuals as specified in the Governing Rules or Standards, Industry Standards, the Port Specifications or other applicable controlling documents. The credentials of the technicians or inspectors performing special process inspections or tests and job control tests shall be reviewed for compliance to applicable codes, standards, special training/tests etc. and accepted by SFI before inspections and tests are performed. Records of credentials shall be maintained by SFI at the jobsite and available to the Port upon request.

The Critical Activity Points Manager (CAPM) will be on-site before the start of any critical construction operation to ensure that the proper inspection and testing has been performed before proceeding to the next stage of construction activity. The Critical Activity Points will be held at the operations detailed in Caltrans' Construction Quality Testing and Inspection Plans.

At a defined Critical Activity Pont, the CAPM will review the Construction Quality Inspection and Testing Plan to determine the testing and/or inspection procedures and documentation that is required. The CAPM will then ensure that the required tests and/or inspections have been performed and provided passing data. The CAPM will invite the Port to be present for verification that the work has been performed to the requirements of the Project. Once it has been determined that the work meets the Project Requirements, and proper documentation has been completed and signed by the CQM, the CAPM will sign off on the Critical Activity Point.

Examples of Critical Activity Points are:

- For concrete pavement—ensure that dowel bars, tie bars and dowel baskets are inspected and released.
- For CIDH Piling—the CIDH Pile Placement Plan is approved; Pre-placement Inspection is signed off; and the hole has been drilled and is awaiting rebar placement.
- For Prestressing Concrete—Approval of Prestress shop drawings; sign off of duct placement, vents, bearing plate alignment, and rebar before completing formwork for stems; testing of duct is complete before concrete placement.

Once the CAPM has signed off at the Critical Activity Point, work may proceed to the next activity.

1.2.3 Document and Data Control

Quality records are documents that document results of design reviews, inspections and tests, and include all other related documents. Quality records are considered valid only if stamped or signed by an authorized individual. Corrections or revisions to quality records shall receive the same level of review and approval as the original document. All quality records shall be available for review by the Port upon request.

Quality records and other project documents shall be properly identified, collected, indexed and stored in a manner that precludes damage, loss or deterioration. Hard copies and electronic copies of quality records and other documents will be maintained by SFI. Storage of the hard copy documents will be protected from exposure to water, fire, wind or other damaging environmental effects as is practical. Electronic documents will be maintained on a central server with automated backup to prevent loss of

documents. Specific retention times and location will be designated and the records shall be accessible for use. Quality records and other project documents will be identified by title, contract number, revision, date, and signed by an authorized individual. All documents related to the Project will be maintained onsite until the completion of the Project.

SFI will utilize a web-based project management system for document control management and for distribution of release-for-construction plans. SFI will use e2020 to develop the web-based system for the Project. It will be customized to suit the needs of the Project both during the design and construction phase.

The main items for the design phase include:

- Complete Sequential Document control
- Agency supply documents
- Meeting minutes
- Submittal schedules
- Design submittals—configured so that the Port can input their comments directly into a database.
- Reports
- Design exceptions
- Permits
- Geotechnical explorations

The main items for the construction phase include (but are not limited to):

- Executive Dashboard
- Agency supply documents
- Reports
- Document Control
- Meeting minutes
- Contacts
- RFIs
- Submittals
- Change Orders
- Design Clarifications
- Issues
- Drawings Released for Construction
- Schedules
- Inspectors' Daily Reports
- Progress Photo Logs
- Permits
- Geotechnical explorations

With a web-based document control system, superintendents and field engineers (as well as the Port) will be able to quickly verify that they have the correct version of RFC plans. In addition, the Quality Manager will perform audits in the field to verify that the correct version of plans and specs are being used.

1.2.4 Design Coordination

SFI will participate in design coordination activities with the Port and other stakeholders. SFI believes an open and transparent partnership with the Port and other stakeholders will benefit all parties and ensure quality work is provided.

1.2.4.1 Over-the-Shoulder Reviews

Over-the-shoulder reviews are generally cursory reviews and are intended to minimize disruption to ongoing design work while providing timely comments and feedback on the design. The scope of an over-the-shoulder review may be more comprehensive should the Port feel it is warranted.

Over-the-shoulder reviews by the Port's representatives (and other approved Project stakeholders, as appropriate) will occur through various reviews, meetings, and through routine day-to-day interaction. Feedback will be documented in meeting minutes when appropriate.

1.2.4.2 In Process Design Workshops

During the design process, SFI or the Port may request an In Process Design Workshop. These workshops will be used to determine design progress and resolve questions and issues.

1.2.4.3 Other Stakeholder Reviews

As applicable, stakeholder organizations, including municipalities, counties, watershed management organizations, or utilities, to name a few, will be given access to review and comment on the design. These reviews can be scheduled and scoped per the Port's direction.

1.2.5 Design Package Submittals

Design package submittals will include concept designs, intermediate designs, final designs, and RFC documents. The design package submittals will be reviewed by the Port. Following the

Port's review, SFI will incorporate comments and other necessary items to ensure the designs are in conformance with the contract document requirements. SFI will not proceed with Work until RFC document submittals are approved by the Port.

Shop drawings and working drawings will be reviewed by SFI's design engineers for approval before use in the field. Shop and working drawings will be processed in accordance with the contract requirements of the Project and the QMP. SFI will submit all shop and working drawings to the Port.

1.2.6 As-Built Documents

SFI will maintain up-to-date as-built drawings during construction of the Project. The as-built drawings will depict the final completed Work. The as-built drawings will include all necessary information related to Work that was done on the Project including utility locations, grades, line, controls, etc. As-built drawings will be prepared in accordance with the requirements of the contract documents. The Port will be furnished with all as-built documents at the completion of the Project. Reviews of the as-built documents will be performed to ensure they are being properly maintained. The Port shall have access to review the as-built documents during the duration of the Project.

1.2.7 Port Access and Testing

All Work performed by SFI under this contract shall be subject to oversight inspection and testing by the Port and other persons designated by the Port. Items to be inspected shall include material and equipment received, in-process and final construction activities, in-process tests, qualification tests, equipment installation and tests, and systems integration testing and acceptance to ensure consistent compliance to contract documents.

Results of inspections and tests shall be validated by printed name, signature and date on the test document by the test technician, reviewing test engineer or appropriate responsible individual and the inspector who witnessed the test.

All materials and each part or detail of the Work may also be subject to inspection and testing by the Port. In addition, when any local agency or utility owner is to accept any portion of the Work, its respective representatives have the right to inspect the Work. Upon request from the Port, SFI shall furnish necessary information to inspection personnel as designated and shall provide access to all parts of the Work that is to be inspected.

The Port may impose inspection critical activity points to verify compliance to contract documents during all phases of Work. SFI will not proceed with Work until each critical activity point has been released by the appropriate QO personnel. It should be noted that inspections by the Port will not relieve SFI from performing contractually required inspections.

SFI will not relinquish its obligations to perform the Work in accordance with the contract documents by reviews, tests, inspections or approvals performed by others. SFI acknowledges that the reviews, inspections, tests, and approvals conducted by the Port, Government agencies and others does not necessarily constitute acceptance of the materials or Work reviewed, tested or inspected.

SFI will make available to the Port all inspection-ready construction before the required tests and inspections. Should work inadvertently be covered before a required examination by the Port or representative of the Port, SFI shall make all work available to be examined as necessary. Once the required examinations are complete and the Work is found to be compliant, SFI shall continue with the Work. If the Work exposed or examined is not in conformance with the requirements of the contract documents, then the Work will be repaired or corrected so that it complies with the contract requirements.

1.2.8 Review and Disposition of Non-Conforming Product

Non-conforming Work is Work that does not conform to the requirements of the Contract Documents. All Work that is determined to be non-conforming by the QO or the Port shall be handled by the same quality procedures detailed in the QMP.

Areas of non-conformance within any part of the Work will cause a Non-Conformance Report (NCR) to be written and processed. The non-conformance will be described and documented by an authorized person of the QO. The QM and CQM for construction non-conformances, or QM and DQM for design non-conformances, will review and sign off on the NCR when the non-conformance is corrected. All NCRs will be processed through the QM.

Non-conformances may be identified or discovered through many mechanisms such as contractor labor, QO personnel, project management, the Port's representatives, etc. All non-conforming work or materials that are discovered shall be referred to the QO. The responding QO individual will issue a NCR that thoroughly describes the non-conformance and proposes corrective actions that should be taken to resolve the deficiency.

SFI will promptly take all actions necessary to prevent similar non-conformances from occurring in the future.

1.2.8.1 Control of Non-Conforming Items

Non-Conformance Reports will be segregated and controlled until the non-conforming condition(s) is analyzed, dispositioned, corrected and the corrective action verified. Only then may the items be returned to use or Work on the non-conforming area be continued. SFI will investigate the cause of non-conformances and will initiate corrective actions including implementing steps to prevent recurrence. The cause of the problem, disposition, and corrective action shall be documented and available to the Port upon request.

Non-conforming hardware and materials shall be reviewed by qualified and authorized individuals to determine the appropriate disposition and corrective action. Disposition of non-conforming items and materials may include:

- Rework to meet the original design.
- Repair to achieve fitness for use.
- Accept the condition as-is if project quality is not compromised.
- Reject the condition and return the hardware and material to the supplier.

Repair and accept-as-is dispositions will require approval by the Port before affected Work proceeds.

The status of non-conforming items shall be maintained and status reports distributed as needed. The status report will track and analyze all NCRs that are issued on the Project to make inferences of the data to aid in the continuing improvement process. SFI's senior management and the Port will be provided the NCR status report at least monthly or as determined to be necessary. Records associated with non-conforming items shall be maintained and available to the Port upon request.

1.2.8.2 Port Issued Non-Conformances

SFI shall respond to the Port issued nonconformance reports, quality action requests and other documented reports of non-conforming or indeterminate conditions within the time period specified. The response shall include a description of investigative actions, statement of the cause of the problem, action to correct the problem and to prevent recurrence to the satisfaction of the Port.

1.2.9 Corrective and Preventative Action

SFI will determine the cause of non-conformances identified by the Quality Program and the Port. Corrective Actions will be developed and implemented to prevent recurrences. If four occurrences or more of the same non-conformance are found, the CM or DM will develop a plan and/or process changes to eliminate the non-conformance in the future, a schedule for implementation, required training, and schedule a follow-up review once the new procedure is in place.

The corrective action will be focused on eliminating the root cause of the problem. There are many ways to determine the cause of the non-conformity, including analysis by an individual or by assignment to a corrective action project team.

The procedure for corrective and preventative action will be included in the quality procedures of the QMP.

1.2.10 Internal Quality Audits

Quality audits and surveillances shall be scheduled, planned, and conducted on an ongoing basis covering all project quality related activities and project phases. The audit/surveillance schedule will be maintained current and available to the Port upon request. Internal quality audits will be performed at least quarterly. The Port Quality Management may participate as an observer on audits/surveillances. Quality audits consist of an evaluation of the effectiveness of a specific process such as purchasing, document control, submittals, risk management, etc. Quality surveillances consist of an evaluation of the effectiveness of a specific activity and follow up of actions required in a previously performed audit.

Qualified, trained and experienced quality personnel independent of those responsible for the activity being audited shall conduct audits and surveillances.

Results of quality audits and surveillances shall be documented and distributed to the manager of the audited activity and the QM for reporting to the Executive Management Committee. The responsible person of the audited department shall conduct investigative actions to determine and document the cause of any problems that are found during the audit and implement corrective actions to resolve the problem and prevent recurrence.

Benzene Plume Mitigation

During procurement design, SFI mitigated the impacts to the benzene plume through reducing foundations.

1.2.10.1 Quality Assurance Audits

Quality assurance audits will be performed by the DQM and CQM to ensure that the respective staff have properly followed the quality procedures and that all applicable reviews and quality requirements have been implemented.

These audits will be performed on a quarterly basis to review design processes and their outputs as well as construction processes and their outputs. These audits shall be separate from the internal audits that are performed by the QM.

QA audits shall verify that quality control functions are being implemented per the QMP for each of the areas of design and construction quality management.

1.2.10.2 Internal Audits

It is the policy of the SFI to conduct internal audits of the QMP. The Quality Manager is responsible for planning and carrying out the audits. The audits will focus on conformance to the quality requirements established by SFI and the requirements of the QMP. The audit results will be part of the review input given to the Executive Management Committee. Internal audits to be completed during the Project include the following:

- Audits of deliverables to the Port or other stakeholders before they are delivered.
- Audits of the document control system.
- Periodic informal spot-audits of Port comment forms, internal comment forms, RFIs, and Design Change paperwork to spot trends, problem areas, or inefficiencies.
- Audits of quality activities.

1.2.11 Risk Management Plan

We have found that identifying and managing risks early in the Project leads to a better quality Project. In order to bring additional value to the Port and facilitate quality design and construction, SFI will implement a *Risk Management Plan* (RMP). SFI will internally identify risks early in the design, and work internally and externally to resolve risks before they impact safety, quality, schedule, or costs.

SFI is committed to prepare and implement an RMP in accordance with the guidelines of the *Project Risk Management Handbook* edited by Caltrans on May 2, 2007. In addition, SFI will follow the benchmarks established by the *Code of Practice for Risk Management of Tunneling Works*, edited by the International Tunneling Insurance Group (ITIG) in 2006. The ITIG Code is one of the most advanced codes available in the construction industry. While the Code was developed for underground works, it is not

limited to that and is applicable to any type of infrastructure project.

This approach will be an invaluable tool available to the Port during its negotiations with the provider of the Builder Risk Policy.

The same approach has been instrumental on the Lake Mead Project (NV) to allow the Owner (Southern Nevada Water Authority (SNWA) to save over 20% of their budgeted premium cost for the same policy.

Purpose and Scope of the Risk Management Plan (RMP)

The purpose of the RMP is to identify the processes and methods that will be implemented to properly manage the project risks and opportunities throughout the duration of the contract.

Risk management is a process of identification, evaluation, mitigation, communication, and monitoring, and involves the following approach:

- Proactive and early identification, evaluation, and management of risks in all phases and at all levels of the Project.
- Anticipation and mitigation of risks, rather than correction of unexpected issues.
- Continuous control and monitoring of risks and opportunities and detailed reporting.
- Proactive communication among all the parties involved with the Project in an effort to facilitate problem solving.
- Full integration of the RMP into the overall project management process.

Organizational Roles

Project Manager

The Project Manager's responsibilities concerning risk and opportunity management are as follows:

- Ensure that the RMP is implemented in compliance with the contract requirements and the standards of the companies that comprise SFI.
- Assign the Risk Manager.
- Assign the individual Risk Owner.
- Approve risk mitigation plans and authorize the necessary resources for implementation.
- Collaborate with the Risk Manager and the Port on any matter related to risk management.

Risk Manager

The responsibilities of the Risk Manager are summarized as follows:

- Develop and implement the Project RMP.
- Organize and promote Risk Identification and Evaluation.
- Organize and Implement Risk Control and Monitoring.
- Implement Risk Reporting.

Risk Owners

The assigned Risk Owners responsibilities will include:

- Implement risk mitigating measures once approved by the Project Manager.
- Identify and evaluate potential risks within their area of responsibility.
- Propose risk mitigating measures for newly identified risks.

Risk Management Facilitator

The Risk Management will be facilitated as part of the Partnering Process. The facilitator's responsibilities will include:

- Review the RMP.
- Facilitate the initial project risk workshop and subsequent brainstorming sessions.
- Assess the RMP's implementation and effectiveness.

Risk Management Process

The risk management process is separated into the following steps:

RISK IDENTIFICATION

- Risk identification throughout all phases of project design and construction involving senior engineers and managers of SFI, the Port, consultants, subcontractors, or any team member, at any level of the organization.

- Dedicated workshops conducted periodically and before the start of any significant activity.

RISK EVALUATION

- Evaluation of probable risk and opportunities, including impact on the Project in terms of safety, quality, environment, schedule, cost, performance, and protection of the affected third parties.
- Each risk will have a specific response plan, identifying the mitigating measures that will be implemented and a timeline for each action. Identification of the residual risk remaining after the implementation of the mitigating measure will also be part of the process.

RISK MONITORING AND REPORTING

- Issuance of the Project Risk Register (PRR), which will be developed at the initial project risk workshop, and subsequent action logs.
- Risk monitoring at periodic intervals to update the status of the implementation of the mitigation plan and its effectiveness, and/or actions decided.
- Updating of the Project Risk Register.

RISK EVALUATION AND CONTROL

- During the identification process to develop the project risk register, qualitative scoring will be implemented, using a scale of 1 to 5, to evaluate the probability of occurrence and potential impact of each risk and to prioritize project focus. The probability and impact ratings are then multiplied to give a score for each risk between 1 and 25.
- Mitigation plans will be developed to control risks. These plans will be detailed after the risks are identified during the sessions indicated above or by the individual Risk Owner in cooperation with the Risk Manager.
- Responses will be classified as follows:
  - Avoid – Eliminating the risk by eliminating the cause.
  - Mitigate – Reduce either the probability or the impact.
  - Actively Accept – Develop a mitigating plan subject to trigger event.
  - Passively Accept – Accept the risk.

  Risk Transfer tools (such as insurance) are not considered an adequate response. They are only tools to be used in case the response is not effective.
- The decision to implement a mitigation plan will be subject to the Project Manager's approval. When a risk mitigating action has been identified, it will be planned and added into the project schedule and budget. The Risk Owner is then responsible for implementation of the plan.
- Status of the Risk Action Plans will be evaluated during periodic review meetings and described in the PRR. Decisions and required completion dates will also be indicated whenever relevant to ensure focus on actions that require immediate attention.

When a Risk Action Plan is implemented, the risk probability/severity (after action implementation) will be reduced accordingly. The quantitative evaluation will be updated to take into account the effect of the risk control action.

Risk Breakdown Structure

An initial Risk Breakdown Structure has been developed during the preparation of the Proposal, and will be further expanded during the preparation of the project-specific RMP.

Examples of a RMP and PRR already implemented by SFI members are enclosed in Volume 4: Confidential and Proprietary information – Technical.

Risks Reporting Tools

The PRR will include the risks identified by SFI during the preparation of the proposal. The PRR will be a "working document" and will be updated during the various phases of the Project until the last risk has been eliminated. The PRR will be organized as follows:

- Classification by categories and subcategories will be in accordance with the identified Risk Breakdown Structure.
- Risks will be identified by a description and risk trigger, when appropriate.
- Risks will be scored in accordance with their probability and severity.

- Severity will be assessed with respect to impacts on cost, schedule, traffic and navigational impacts during construction, impacts to the environment and surrounding community and other factors, including health and safety, quality, performance, and third parties.
- Each risk will be scored within the above categories in accordance with the matrix included in the RMP.
- Each risk will have a Risk Response Plan identified, including the mitigating measure to be implemented and an estimated timeline for each of the above measures.
- A scoring of the residual risks following implementation of the mitigating measure identified will be included.
- The ownership of each risk will be identified within the SFI organization. SFI believes that the PRR is a tool to properly manage the risk associated with the Project and does not consider the PRR a contractual tool to address or resolve potential disputes.

SOFTWARE

The PRR for the GDB Project will be managed using a job-specific custom database program written in Microsoft Access. The Access database can be customized to analyze risks based on time, cost or within other established parameters. One of the key advantages of using a database is that the mass of information collected is reported concisely and in a manner that is easy to understand. Another advantage of using a database is its unique ability to query information in an infinite number of ways. Statistical analysis of the data can be performed on categorical and continuous variables to answer other performance management questions, enabling SFI to better manage Project risks.

RISK ACTION LOGS

Actions identified to control risk and approved by the Project Manager will be archived in a dedicated project log maintained by the Risk Manager. This project log will be used to monitor the status of risk actions and implementation during the course of the Project.

PROJECT RISK REPORTS

Project Risk Reports will include a summary of the activities for the last period and that of the next. Included in the Reports will be new risks and opportunities identified and main actions decided during the period, as well as risks closed and those risks that actually were realized and impacted the Project. This document will also present the status and actions taken on the top risks.

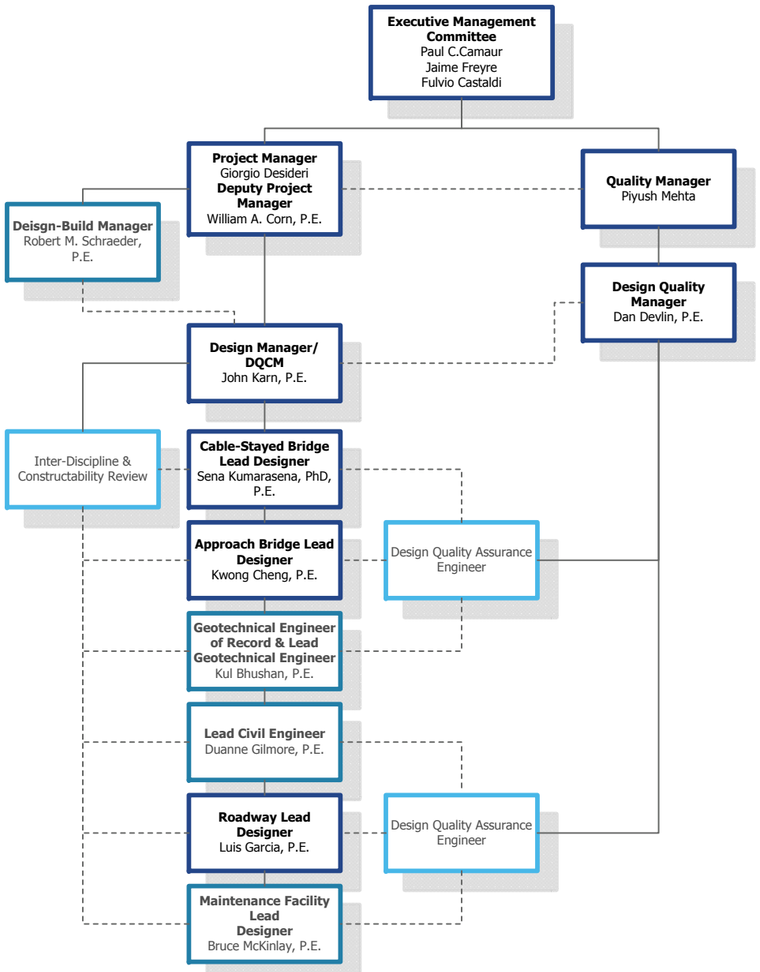

Figure 1.2-1: Design quality organization chart.

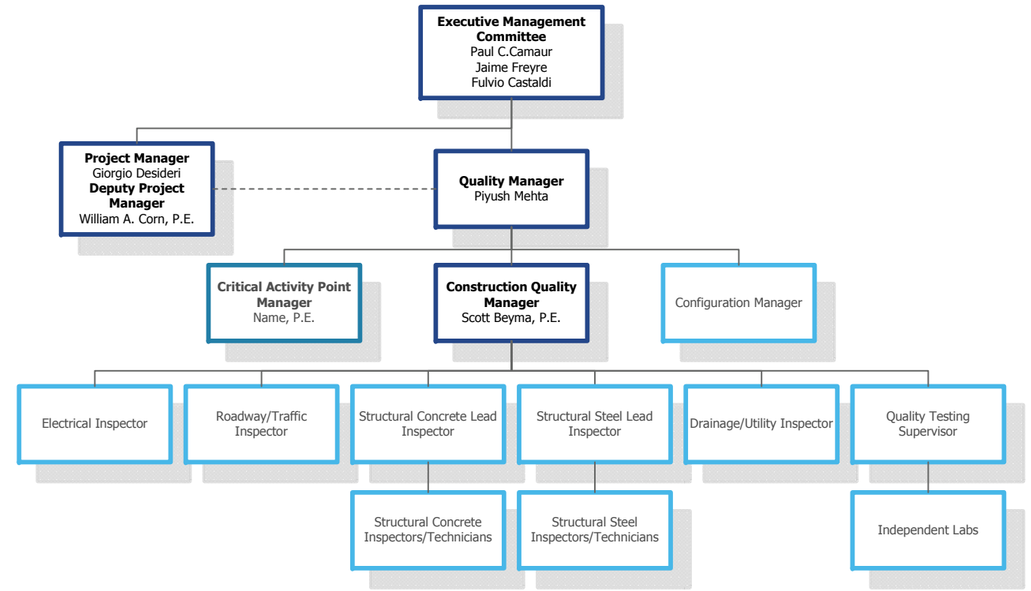

Figure 1.2-2: Construction quality organization chart.