

**Great Wolf Lodge
Garden Grove**

EXHIBIT - G

**CONTRACTORS QUALITY CONTROL
PROGRAM**

*Built-in Quality
... Starts With a Strong Plan*

Turner

February 28, 2013

TABLE OF CONTENTS:

1	Overview/Purpose
2	Preconstruction/Subcontractors Selection Process
3	Pre-Mobilization/Pre-Installation
4	Mockups/Water Testing
5	Field Installation Verification Process
6	Right-To-Know Area: Collaboration, Trust, transparency
7	Risk Mitigation (Protection of Installed Work)
8	Virtual Building
9	Scorecard
10	Start-Up and Commissioning Program
11	Jurisdiction Approvals and Licensing
12	Owner Acceptance Process
13	Lessons Learned

1.0 Overview/Purpose

1.1 Overview

TURNER and the team will foster a relationship that will establish a new benchmark for the Great Wolf Lodge. Starting with the design phase, this mind set and discipline regards Quality as conformance to design, specification, Code, and other applicable jurisdictional requirements.

1.2 TURNER Responsibilities

The Quality Control Plan will be administrated by TURNER field supervisory personnel. General responsibilities include the following:

- Administer the “record” Quality Control Plan for the project.
- Review and evaluate the Subcontractor Quality control plans and procedures.
- Review plans, specifications, submittals, shop drawings, and standards prior to inspections to ensure compliance by Subcontractors.
- Verify that Subcontractors are using the latest construction documents to complete their work.
- Facilitate pre-inspection meetings with Subcontractors.
- Schedule inspections and coordinate attendance by Subcontractors, Trade Partners, Owner, Design Team, and AHJ as required.
- Schedule and coordinate preconstruction meetings for specific trades such as roofing and waterproofing that require multiple parties such as the Architect and the manufacture present to confirm proper installation practices.
- Establish inspection points, coordinate, and oversee the field inspection activities of Subcontractor and/or third party inspectors.
- Facilitate procedures for each type of inspection.
- Initiate action to prevent, stop, or correct the occurrence of deficient work and non-conformances.
- Maintain records of responsible inspections, testing, non-conformances and corrective actions.
- Coordinate equipment receiving inspections as required for Owner Furnished Contractor Installed (OFCI) equipment.
- Maintain a complete set of construction documents including specifications, sketches, RFI's, and field changes at the project site.
- Implement the *Zero Defects Program*.

2.0 Preconstruction – Subcontractor Selection Process

A primary responsibility of TURNER is to ensure that all of the hand selected Trade Partners are capable and committed to delivering Quality work. This will accomplished by employing the following measures:

2.1 Pre-Qualification

TURNER will verify Subcontractors for financial standing and references to confirm that they can meet Quality, manpower, and schedule performance requirements.

2.2 Select Bid List

TURNER will develop and propose a qualified Subcontractor bid list, comprised of Subcontractors with proven track records of schedule and Quality performance on similar type projects. Subcontractor bid lists for the project will be reviewed and approved by the Management Team prior to the start of the bidding process.

2.3 Preconstruction Forms

Following prequalification, TURNER will provide the Trades Partners a compact disc with information necessary to successfully budget and bid the project. These items include:

- Bid Form
- Project Schedule
- Prime Contract Copy
- TURNER Insurance Requirements
- TURNER Subcontractor Billing Package
- TURNER Standard Subcontract
- Site Specific Logistics Plan
- BIM Protocol
- Site Specific Safety Plan

2.4 Instructions to Bidders Checklist

TURNER will require Subcontractors to perform all work in accordance with the Contract Documents, per manufacturers recommended installation procedures, per industry standards and per all national, state and local codes. Subcontractors are instructed to provide a complete project scope document including work shown on the drawings and specifications. In addition, the instructions to bidders are detailed to include scope requirements that may not be clearly identified in the Contract Documents, such as directing a finish trade to completely cover and protect their work after installation. Instructions to bidders are also used to outline Quality expectations and requirements such as mockup size and types and other key Quality focus points.

2.5 Post-Bid Interviews

TURNER will meet with selected Trade Partners to confirm bids in accordance with the plans and specifications and to establish Quality expectations. At their discretion, the Management Team can participate in post-bid meetings for significant packages. This is part of the standardized form signed by a representative of TURNER and the Subcontractor attending the interview meeting.

2.6 Review Sub Procurement Plan/Lead Times

Equipment and material lead times are essential to planning the schedule and timing of deliveries to benefit Quality requirements. Each Subcontractor must submit a schedule for all submittals required and a detailed materials and equipment procurement schedule based on accurate lead times for review and approval. This project will be utilizing *Short Interval Planning* to schedule the execution of day-to-day tasks, including submittals and procurement.

2.7 Review Subcontractor Quality Program

TURNER requires that major Trades Partners provide a written Quality Program to include specific Quality control measures, monitoring requirements, testing, observations, and inspections. These programs are essential for progress as early as submittals, shop fabrication and storage through delivery, staging, installation, protection-in-place, and final

approvals. Each Subcontractor's Quality Program must further include the following items:

- A schedule of all required submittals.
- A materials and equipment procurement schedule.
- A list of all Pre-construction Meeting requirements.
- A list of all inspections and tests required per plans and specifications referenced by specification section and paragraph number.
- A list of all mockups and "first installed work" requiring approval by the Management Team.
- The list of the "Quality Assurance" requirements per Specifications.
- The list of the "Field Quality Control" requirements per Specifications.
- A Quality Control Team Organizational Chart indicating the duties, and responsibilities and authority of team members. Description of the Subcontractor's Quality organization in the field and specific Quality control responsibilities of field personnel. Identify personnel in charge of Quality assurance and field Quality control.
- A list of all utility outages required – Utility Outages indicating the work activity, the utility, and flow of work.
- An outline of all Start-up Schedules, Commissioning Requirements, Attic Stock Requirements, Punch List Procedures, As-built Drawings and Warranty Provisions.
- Testing and Inspection Plan & Procedures
- Document Control, if applicable
- BIM Quality Assurance Protocol

In addition to the above requirements, the following is also expected of each Subcontractor:

- Quality Control Plan must be updated monthly.
- Timely request of and participation in pre-submittal meetings, if required, to expedite the submittal process.
- Participation in pre-inspection meetings.
- Participation in TURNER Quality inspections.
- Recommendations for the correction of deficient work, as well as assessment of the impact on the project schedule.
- Provide a schedule recovery plan if nonconforming work has an impact on the project schedule.

2.8 Subcontract Issuance

Following approval by the Owner, contracts are issued requiring Subcontractors to perform Quality installation in accordance with the project documents. Key scope items from the instructions to bidders and post-bid interviews are written into the subcontract agreements.

3.0 Pre-Mobilization/Pre-Installation

To the maximum extent possible, Quality is ensured by “building on paper” prior to field activity.

3.1 Preconstruction Kick-off Meetings

TURNER will facilitate preconstruction meetings with the Trade Partners to reinforce Quality expectations a minimum of two weeks prior to the start of any on-site activity. The preconstruction meetings will focus on: requirements outlined in the project documents, specific details requiring special attention, Trade Partner’s Quality control plans, testing and inspection requirements, and key safety issues.

3.2 Employee Orientation

TURNER superintendents and an on-site safety leader will meet with every member of the workforce on the morning of their first day to emphasize Quality and Safety expectations. Employees are required to sign a form indicating that they have attended the session and understand all topics covered. Separate sessions are conducted for Spanish-speaking employees.

The discussion will also include the basics of Lean practices that have been and will continue to be implemented on the project. These include discussions on the importance of the *Last Planner System* and the requirement to share any ideas that tradespeople have long wanted to try. A way to track these ideas will be created and recognition for those ideas will be shared at the All Hands Safety Meetings.

3.3 Weekly Trade Partner Coordination Meetings

An important element of maintaining a Quality product is keeping the work protected once it has been put in place. At weekly the Trade Partner foremen meetings, temporary protection requirements for completed work, phasing of the work, and interim cleanup are discussed to minimize the amount of damage to finished work by other trades. In addition, the completion list will be distributed and discussed.

3.4 Review/Discuss Trade Partners Quality Control Plan

A Quality Control Plan is requested from the major Subcontractors on the project. TURNER will initiate an interactive conversation aimed at encouraging total participation from all Subcontractors. The Trade Partners Quality control plan should cover main project execution concerns:

- Site logistics
- Field inspections
- Non-conforming corrective work ; non-conforming work is work that has been put into place without the acceptance of the Inspector or AHJ. If this work is covered up without acceptance by the Inspector or AHJ, a Notice of Non-Compliance is sent to the Owner and to the Compliance Officer. Any Non-Conforming work will have to be made acceptable to the Governing Entity prior to any final inspection being obtained.
- Teamwork with emphasis on participation from all trades at all levels

This is an iterative process throughout coordination and adjusted to the specifics of each construction phase.

3.5 Submittal and Shop Drawing Update

TURNER will review Trade Partner submittals and shop drawings for conformance to the Contract Documents. Upon receipt of submittal materials, as necessary, Turner will arrange a meeting with the design professional having jurisdiction to collaboratively review the materials. This meeting may include the submitting Trade Partner; this representative must have the ability to negotiate with the team to bring any issues to resolution. Submittals are not to be returned in any fashion other than *No Exception Taken, Make Noted Corrections, Approved as Noted*, or similar

remark. The intent of this review process is to do away with the traditional back and forth review process that drags a project down.

3.6 Schedule

The milestone and phase construction schedules generated early in the project will identify sequencing and durations of punch list activities for various areas of the building. Pre-punch activities for Trade Partners will be designated and specific punch list walks for the designers will be scheduled as the project nears that phase. The project schedule will also show target durations for completing the work. The intent of showing this level of detail on the construction schedule is to communicate the series of key activities tied to substantial completion and to allow the Design Team to plan their work load.

Towards the end of the project, as areas of the building are starting to be completed, the punch list schedule will be pull-planned and reliably committed dates will be transferred to “punch list maps” (color highlighted floor plans). These maps will typically be posted in meeting areas where all team members have access to the information so the entire construction team knows the status of the project.

It is anticipated that the Architect and consultants will submit their incremental punch lists to TURNER. It is TURNER’s intent to phase these punch list walks so that they can start several weeks prior to substantial completion and the closed out areas can be locked off from further access. It is the intent to have the items resolved prior to substantial completion.

3.7 OAC Meetings

The project team will meet weekly on site at our Owner, Architect, and Contractor (OAC) Meetings. These meetings will serve as the venue to communicate the elements of our Quality Control strategy. Early in the project, the emphasis will be on the overall strategy, and then evolve toward reviews of mockups and “first installed work.” As the work in the field progresses, the emphasis will shift to discussion of various field walk issues and administration of the Zero Defect List. During the last few months of construction, punch listing sequence and strategy will be finalized and communicated to all team members. These meetings will be conducted differently than traditional meetings as there will be no need for formal minutes to be published as the Team members are all responsible

for their own commitments for the project. These commitments should be tracked on a separate pull plan that is integrated into the weekly PPC.

4.0 Mockups/Testing

4.1 Construction Mockup Types

TURNER builds construction mockups at the project site to help establish construction procedures, sequence of installation, material compatibility, and “fit & finish”. This reviewed and accepted installation is the standard (benchmark) against which all subsequent installations are measured. A mockup of a typical patient room has been constructed on site and will be used to set a level of Quality going forward by all trades. As part of site orientation, new tradespeople will be toured through the accepted mockup to insure compliance. The mockups will be reviewed with the project team for approval and acceptance prior to installation of the work in the field.

“First installed work,” sometimes referred to as benchmarks, differs from mockups in that the work remains in place after inspection by the Core Team. These benchmarks are provided for certain items of work where it is not feasible to do a separate mockup. Items such as drywall finishing, ceiling architectural features, specialty lighting, thermostat locations, electrical outlet locations in exam rooms and offices will be reviewed when the first of a series of items is completed. Typical above-ceiling mechanical and electrical items such as mechanical VAV boxes, valves, piping supports and ceiling grid supported light fixtures will be reviewed with the Design Engineers and/or Owners representative for Quality of work and service access prior to installing ceiling tile.

4.2 Third Party Exterior Consultants

The OWNER will hire and pay for an independent consultant to assist in assuring the water-tightness of the exterior skin components such as waterproofing, windows, and curtain wall. The independent consultant will be involved with the following activities:

- Review proposed materials and construction methods
- Review plans and specifications for completeness and conflicts
- Review Trade Partner submittals

- Perform water testing on site
- We need to review this issue

The Architects will participate in designing mockups and partake in tests and inspections. TURNER will discuss these tests and inspections with project stakeholders in the weekly OAC meetings. 48hrs advance notifications will be sent to all stakeholders with exact time/location of upcoming tests and/or inspections. Following final approval, TURNER will release the respective Trade Partners to proceed with the installation of those segments of the work.

4.3 Water Intrusion Prevention Response Plan

The essence of the Water Intrusion Prevention and Response Plan is to take a proactive approach towards minimizing the risk of exposure of installed Work to water damage during construction and to have a clearly identified course of action in place in the occurrence of an event that creates a condition where Work in place or materials are exposed to potential water damage.

The execution of this plan will ensure that the facility that will be turned over will be one that is exempt from any potential water infiltration risks such as microbial and bacterial growth, mold or sick building syndrome (SBS).

1. Sources of Water Intrusion Exposure

Prior to the completion of the building envelope (building exterior skin and roof), water and moisture generated from rain will be the main source of exposure to water damage. Once the building envelope is complete the main source of water damage will be leaks from building hydronic, plumbing or fire protection pipes.

According to the National Weather Service, the rain season in the Los Angeles Area starts in November and ends in March. Based on this time frame, the rain season extending from November to March will be the time interval where the project will endure the most exposure to water intrusion due to rain.

The WIPR will be created under a separate cover, and available for review prior to 2014 Rainy season (November to March).

5.0 Field Installation Verification Process

TURNER is responsible for maintaining an “eye for Quality” as the work progresses. This includes not only the aesthetics and “fit & finish” of the Work, but compliance with the Contract Document requirements.

5.1 QWAMBA (Daily Field Inspections) or Quality Management by Walking Around

TURNER will walk the project on a daily basis looking for and resolving Quality issues. Many small issues can be worked out before becoming larger issues. The work is also reviewed by the Architect’s and Engineer’s representatives as well as governmental and special inspectors. Ideally, the Architect’s representative walks the project at least once a week, prior to the OAC meeting, to review Quality of work in-place with observations being presented during the subsequent meeting. Field reports are presented on monthly basis or at major work milestones.

5.2 Delivery Inspection (1st receipt)

All Trade Partners are to inspect major material and equipment deliveries to verify and confirm Quality, size, and conformance with shop drawings and other applicable Contract Documents.

5.3 Subcontractors Inspections, Checklists and Sign Off

Although the Quality of work will be viewed periodically by the Core Team representatives, the AHJ, Architect, and consultants, it will first be the responsibility of each Subcontractor to plan and monitor the Quality of their own work. These Quality control measures will be reviewed at pre-construction meetings and revisited throughout the course of construction by TURNER field personnel as construction progresses.

The Trade Partners work will be inspected using the following four point inspection plan.

1. Preparatory Inspection: This includes a variety of meetings and reviews that are completed prior to commencing the work.

2. Initial Inspection: This inspection takes place upon completion of a representative sample of a given feature of the work. TURNER executes this through mockups and “first installed work” inspections. These review meetings may also be attended by Core Team, IOR, and Subcontractors.
3. Follow-up Inspections: These inspections and field observations occur after the Initial Inspection to assure the continuing conformance of the work to the establish standards. TURNER executes this through daily observation and surveillance, recording in writing all non-conformance items on the Zero Defect List.
4. Completion Inspections: These inspections occur upon completion of a given feature of the work. TURNER executes this through such methods as wall and ceiling closure inspections, pressure tests of plumbing and mechanical systems, and field observations of work using checklists when a Subcontractor’s work is substantially complete. When the work involves OFCI equipment TURNER will request the Owner’s participation.

Certain construction activities may be reviewed by multiple trades for conformance to plans and specifications prior to completion of work. For example, concrete reinforcing and formwork must be reviewed and signed off by TURNER, the reinforcing steel sub, as well as the mechanical and electrical Subcontractors prior to concrete being placed.

The IOR Team will be asked to inspect an item or an area only after the Subcontractor requesting inspection and Turner has reviewed and accepted the item or area.

5.4 Special Inspections

Certain portions of the project are required to have special consultants or inspect the work. Test reports and certifications are submitted to TURNER and kept in the jobsite office. Copies may be delivered to the IFOA commissioning agent.

Some of the key entities carrying special inspections on this project are:

- **City of Garden Grove** – Site work and site under ground
- **Construction Testing Services** – Soils, concrete material, full-penetration welding, and spray fire-proofing.
- **Independent Construction Consultants** – Inspection liaisons & Owner representatives.

In the case of some specific scopes of work, independent inspection services will be provided by the Owner to inspect and/or test various

scopes of the Work as outlined in the plans and specifications, required by the soils report, required by the building code, or required by local governing agencies. These scopes of work include but are not limited to soils, concrete, concrete & masonry bolts, structural steel, structural welding, high strength bolting, expansion anchors, masonry, fire proofing, torque testing, epoxy anchors, etc.

5.5 Incentive Program: Recognition and “Big Picture” Perspective

TURNER is reviewing various programs that would inspire the individual craft personnel at the site to the highest levels of pride in their workmanship. The premise is that most craftsmen begin each day with the intention of doing great work. Every time the Owner team openly recognizes and reinforces Quality work, it inspires craft personnel to higher levels of Quality execution. This is a “transforming” type of idea consistent with the mission of the Owner. Such programs could include inviting selected trades/crews to Quality roundtable discussions offering “free lunch”, distribution of hard hat stickers, t-shirt rewards (for craft “caught” doing Quality work), etc.

5.6 Corrective Action

The Quality Control Program is meant to be proactive so that errors can be detected early or prevented altogether. If a nonconforming item of work is discovered, corrective actions are taken to bring the work into compliance. The corrective actions do not stop with just “fixing the work.” To prevent recurrence of errors, the root cause of the nonconformance is examined. Once the root cause is identified, the source of the noncompliance can be addressed. This could be something as simple as providing additional worker training for a specialized type of work or revising the pre-construction meeting requirements to incorporate additional checks and balances, or it may be as broad as revising the overall Quality Control Plan.

5.7 Zero Defects/Rolling Completion List

An important element of the Quality Control Plan is the continuous review and monitoring of the work as it is being put in place. Throughout the course of construction, there will be routine reviews of the work by independent inspectors, designers, consultants, Owner representatives,

TURNER, and Subcontractors. As field walks and inspections are completed, it is anticipated any deficiencies or items requiring further action will be noted on field observation reports. These corrective items will be reviewed and then recorded in one central location for tracking purposes. Jobsite Project Management will create a tracking module entitled “Zero Defects” that will serve as a central repository for all items requiring attention. The Zero Defect List will be regularly distributed to the Subcontractors. As the items are corrected, they will be promptly reviewed and verified by TURNER and re-inspected by the appropriate parties to ensure they have been addressed.

5.8 Quality Control Log

The Quality Control Log is to be used as a means of planning and tracking the project Quality control activities. When the project master schedule is complete and the main Subcontractors are on board, the project team identifies Quality control inspections and their target dates for the project. This becomes the basis for all advance notifications sent to various project stakeholders, such as Owner, Architect, Engineer, Subcontractors, and Third Party consultants. Printouts of the QC Log one-week look ahead will be attached to the OAC agenda so stakeholders can plan their attendance.

At a minimum the inspections entered in the QC Log are as follows:

- First receipt
- First in-place
- Mockup
- Benchmark
- Closure (above ceiling/in-wall/below raised floor)
- Milestone

Documentation generated by these inspections (except for closure inspections) is collected in the QC Binder.

The site team is also managing special and city inspections, as well as number of tests not entered in this log. At a minimum these inspections are as follows:

- Soils
- Concrete strength cylinders, slump tests
- Rebar
- Structural steel

- Seismic
- Framing
- Sheet rock (type, layers, screws, joint staggering)

The documentation generated by these inspections and tests is collected in dedicated binders set up and maintained by field supervisory personnel, e.g. Superintendent, Assistant Superintendent, Foremen.

6.0 Right-to-Know Area: Collaboration, Trust, Transparency

At TURNER, Quality receives the same attention as Safety, and as such the Quality control program and its progressively accumulated documentation is placed in a highly visible Right-to-Know Area, readily accessible to all project stakeholders.

6.1 Quality Control “Right-to-Know”

The Quality Control “Right-to-Know” Area is set up in the TURNER site trailer next to project Specifications and is available for review at any time during business hours. The Quality control documentation consists of at least two distinct sets of binders containing the following documentation:

Set 1

- QC Program
- QC Log (printout of Excel spreadsheet)
- First Receipt inspections
- First In-place inspections
- Benchmark inspections
- Mockup inspections
- Milestone inspections
- Weekly photo record of project progress

Set 2

- Special inspections (soils, concrete, MEP rough-in, framing, sheet rock)
- City inspections
- ADA, Structural Steel, Fire Proofing (checklists + highlighted drawings)
- Concealed Space: above ceiling/in-walls (checklists + highlighted drawings)

TURNER believes that transparency of the Quality process is an essential element to consistent and efficient collaboration amongst all project stakeholders.

6.2 Quality Control Documentation

Test and Inspection Forms, Zero Defect List, Notices to Comply, and Field Observation Reports remain part of the Quality Control Plan, but hard copies of signed reports will be filed in separate binders or files. Since the project duration spans nearly two years the amount of documentation anticipated will take several volumes of 3-ring binders. Electronic copies of the original documents are maintained in the Project Management software. Signed originals of completed test reports will be maintained on site.

6.3 SWPPP

Site access will be provided to the SWPPP monitors for inspections and sampling. As a Risk Level 1 project, as specified in the revised Permit, Risk Level 1 dischargers shall ensure that:

- All inspection, maintenance repair and sampling activities at the project location shall be performed or supervised by a Qualified SWPPP Practitioner (QSP) representing the discharger. The QSP may delegate any or all of these activities to an employee trained to do the task(s) appropriately, but shall ensure adequate deployment.
- For storm water discharges, Risk Level 1 dischargers shall perform weekly inspections and observations, and at least once each 24-hour period during extended storm events, to identify and record BMPs that need maintenance to operate effectively, that have failed, or that could fail to operate as intended. Inspectors shall be the QSP or be trained by the QSP.
- Upon identifying failures or other shortcomings, as directed by the QSP, Risk Level 1 dischargers shall begin implementing repairs or design changes to BMPs within 72 hours of identification and complete the changes as soon as possible.
- For each inspection required, Risk Level 1 dischargers shall complete an inspection checklist, using a form provided by the State Water Board or Regional Water Board or in an alternative format.

- For non-storm water discharges, Risk Level 1 dischargers shall conduct one visual observation (inspection) quarterly in each of the following periods: January- March, April-June, July-September, and October-December. Visual observation inspections are only required during daylight hours (sunrise to sunset). The results of all inspections and assessments shall be documented, a copy shall be provided to the Owner/Developer/Contractor within 24 hours of the inspection, and copies of the completed inspection checklists shall be maintained with the SWPPP. Site inspections conducted for monitoring purposes shall be performed using the inspection checklist included in the SWPPP:

Water Quality Monitoring and Sampling

Task 2 focuses on the project run-off sampling during the wet weather events. SWPPP monitor will assign a staff member who will be available in the field during each rain event. Prior to commencing work, all sampling personnel and alternates will review the sampling and analysis plan (SAP).

The sub-tasks associated with water Quality sampling during each wet season are listed below.

- A onetime team orientation and site visit
- Weather Tracking
- Pre-storm preparation
- Deploy field staff and monitor
- Prepare samples for delivery
- Transcribe field measurements
- Review laboratory data packages upon submittal

7.0 Risk Mitigation (Protection of Installed Work)

7.1 Protection of Finished Products Plan

Subcontractors are required (per contract) to respect and protect work already in-place from being damaged by others and/or their own work-in-progress.

7.2 Roof Protection Plan

Each roofing material manufacturer has construction-duration protection guidelines and warranty requirements. TURNER ensures that the roofing Subcontractors and any other workforce that has roof access adhere to these guidelines. The project team will hold a pre-roofing meeting with main roofing contractor, any other roof-related Subcontractors and TURNER. TURNER also requires roofing representative to attend both, a pre & post installation meeting.

7.3 Verification of Existing Built-In Performance/Conditions

- 7.3.1 Floor Moisture Tests will be implemented per contract specifications.
- 7.3.2 IAQ (Indoor Air Quality) Plan: 10 day mechanical flush out activity will commence prior to building turnover.
- 7.3.3 Air sampling: Test will be performed after the IAQ flush period to baseline results.

8.0 Virtual Building

8.1 3D BIM MEP Coordination

This project is being fully designed in 3D BIM using *NavisWorks*, a computer program used for clash detection between systems. Clashes will be identified and resolved during weekly design meetings with all pertinent parties.

An added benefit of the BIM process is that the 3D model can be used for visualization purposes for the project team. TURNER and Subcontractors have already seen a benefit from the BIM process in terms of saving time during all phases of installation, reducing rework, and minimizing RFIs.

9.0 Scorecard

9.1 Quality Consistency Survey (QCS)

The Quality Consistency Survey (QCS) is the cornerstone of TURNER's Quality program. By reviewing upstream indicators on a monthly basis

with the project team, the culture and mindset of total Quality is reinforced. The project team (including the project estimator) is scored on their work with respect to Quality. The team will be held accountable for establishing its own site-specific Quality plan and following through with all Quality activities identified on the QCS.

The QCS is a flexible document being adapted to the specifics of the project, whereby the score reflects the circumstances and challenges of each project. Most items in the survey are directed toward upstream/leading indicators of Quality in preconstruction, construction, and Closeout, intended to prevent errors, or detect and correct them in a timely manner.

While prevention of errors is the most desirable avenue to superior Quality, detection and timely correction are acceptable as long they are properly tracked. Results of the QCS are reported to the appropriate regional office with data tracked for all projects nationwide. Data is reviewed to identify potential trends, Quality issues and to share lessons learned nationally.

10.0 Start-Up and Commissioning Program

10.1 Start Up Sequence

Getting the start-up and commissioning team involved early in the project has proven to be an essential Quality assurance activity from inspection and verification of proper equipment, through installation and performance of all systems. Implementing the start-up and commissioning program assures the turnover of a completed project that is performing as designed and not requiring call-backs following turnover and occupancy.

The purpose of the start-up and commissioning process is to provide the Owner and operator of the facility with MEP systems that have been installed according to the Contract Documents and operate within the performance guidelines set forth by the basis of design (BOD) and the Owner's Project Requirements (OPR).

The start-up and commissioning process does not preclude the responsibility of the installing Subcontractor to provide a finished, completely installed, and fully functional operating system in accordance with the Contract Documents. It is the responsibility of the installing

Subcontractors to be an active participant and support the commissioning process along with the other members of the commissioning team.

10.2 The 5 Level TURNER Start-Up and Commissioning Plan

- The Owner will hire and pay for a 3rd Party Start-up and Commissioning Agent for the project. The Start-up and Commissioning Plan is the responsibility of the owner's Commissioning Agent.
- **Level 1** involves review of design drawings and specification, Subcontractors' submittals, and construction subcontracts. These documents are reviewed for completeness and constructability, identifying scope-gaps, maintenance, and serviceability.
- **Level 2** entails verification of equipment upon delivery to site, the Subcontractors completing the receiving checklist to determine that the correct equipment has arrived on site. Subcontractors signs and submits the completed checklist to TURNER for review and inclusion in the commissioning and QC program binders.
- **Level 3** involves in-progress verification of equipment and system installation. It is important for the MEP coordinator and commissioning agent/authority to provide this verification early in the installation process, thus minimizing the occurrence of non-conformances and potential rework. The Subcontractors will need to sign and submit the Level 3 checklist to TURNER for review and inclusion in the commissioning and QC program binders.
- **Level 4** involves site MEP equipment and system acceptance testing (factory or standard) with the Subcontractors and/or their vendors submitting start-up and commissioning reports. The Subcontractors will need to sign and submit the Level 4 checklist to TURNER for review and inclusion in the commissioning and QC program binders.
- **Level 5** involves integrated functional performance testing for all Mechanical, Electrical, and Piping systems. Functional performance testing requirements shall be written by commissioning agent/authority, then reviewed and pre-approved by the Owner, Design Team, and TURNER.

10.3 Early Start Up of equipment

Included in commissioning plan.

10.4 Training users to best utilize their workspace

Included in commissioning plan.

11.0 Jurisdiction Approvals and Licensing

Table 11.1: Jurisdiction/Entities	
Jurisdiction	Entity
Fire Department	Orange County Fire Authority
Health Department	TBD with Owner if any necessary action is required by the County of Orange Health Department.
Building Department	City of Garden Grove
Public Works Department	Not applicable
Planning and Zoning Department	City of Garden Grove
Traffic Department	City of Garden Grove
FAA	FAA
Electric Services	Southern California Edison
Reclaimed Water	Orange County Water District
EPA	Not applicable

12.0 Owner Acceptance Process

Based on schedule and real progress of the project, the project team will carry out Acceptance Inspections of the work or large segments thereof. These inspections document Substantial Completion, Partial Completion, or Final Completion. Inspection forms, digital photographs, and observation comments are saved in the project QC binder. When non-conformances are detected, the project team will decide on a specific course of corrective action, captured and tracked in the Rolling Completion List.

12.1 Early Pre-walk

The Owner's project team will be performing pre-walks leading up to the substantial completion date.

12.2 Milestone Quality walks

Based on project schedule, the site team will choose completion of specific milestones to be signed-off in the context of formal inspections. These inspections will be attended by all installing Subcontractors, Owner Representative, and other principal stakeholders. Inspection forms, digital photographs and observation comments are saved in the project QC Binder. When non-conformances are detected, the site team, along with the Owner Representative, will decide on a specific course of corrective action, captured and tracked in the Rolling Completion List.

12.3 Close-Out Documents to Owner

Closeout documents to be officially submitted include the following:

- Close-out submittals
- As-Builts
- Warranties
- Operation and Maintenance Manuals

12.4 Architect Punch List/Owner Acceptance

Owner/Architect members and major Subcontractors will walk the buildings and site with TURNER each week in an effort to support the Quality initiatives mentioned above. TURNER will maintain the Rolling Completion Lists to capture items at variance with contractual requirements and track resolution; the Core Group will sign-off acceptance of corrective actions. As mentioned in the Zero Defects section, the project goal is that at all non-conformances for each area are addressed and resolved before the date of Substantial Completion. In the event that minor items are identified during Substantial Completion walk-throughs, the Core Group will issue a Punchlist to be attached to the AIA Substantial Completion form. TURNER will quickly address and correct Punchlist items, then confirm and document the Core Group approval and acceptance of the corrected work.

12.5 Final Clean and Move-in schedule

TURNER will insist on a rough clean, followed by a final clean. The Owner's terminal clean will commence once punchlist is completed, prior to occupancy.

12.6 Final Walk and Project Turnover

The Owner's project team will perform final walk and turn the project over.

13.0 Lessons Learned

Quality events such as inspections, site walks, and tests often yield new knowledge and new ways of doing things with better Quality outcomes. As a learning organization that firmly believes in the benefits of continuous improvement, TURNER captures, collects, and manages lessons learned through a shared knowledge intranet database. This information will be collected by the project team on a monthly basis and then placed on the local intranet for other project teams' use and knowledge. In addition, "Lessons Learned" are communicated through the Quality Consistency Survey process and captured at the regional and national level. These valuable lessons are then made available to new and continuing project teams with the goal of never repeating the same mistake twice.

End of Document