



# Building Supplemental Instructions

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## General Notes:

- 1. Any and all quantities noted on the construction drawings shall be used for general reference purposes only. The contractor is responsible to determine all final quantities.**
- 2. Without specific written consent given prior to bid by the City of Scottsdale product catalog numbers listed in Section 13: Preferred Products shall take precedence over those listed in other specification sections and/or those reviewed by the architect/engineer during shop drawing review. Questions and/or conflicts shall be sent in writing to the Architect for resolution prior to bid.**

## **Section 1: Inspection and Construction Management**

### **A. General Requirements**

1. Submit written electrical "Lock Out Tag Out" procedures to the City of Scottsdale (COS) Construction Administration Supervisor prior to the beginning of construction.
2. The COS Inspector shall be given a minimum of one (1) business day advance notice when third party testing and/or inspections are required.
3. General Contractor daily reports shall be submitted via email to the COS Inspector by the end of the following business day.

## **Section 2: Exterior**

### **A. General Requirements**

1. All landscape, plumbing and electrical sleeves under footers, sidewalks, etc. shall be sealed.
2. Spare sleeves shall have a removable cap on each end and a #12 tracer wire installed the entire length of the sleeve.

## **Section 3: Roofing**

### **A. General Requirements**

1. Crickets shall be installed on the uphill side of any equipment base, ductwork, etc. wider than 12".
2. The interior of parapet walls 48" and less in height (not viewable by the general public) shall have the roofing material run up the wall and under the parapet cap. Parapet walls over 48" high shall have the roofing material run up the wall 18" minimum.

## **Section 4: Painting**

### **A. General Requirements**

1. REMINDER: Priming/preparation as required in the specifications shall be strictly enforced.
2. All cover plates, hardware, etc. shall be removed prior to priming/painting.
3. Three coat systems shall have a white primer coat, 1<sup>st</sup> paint coat shall be 20% darker than final color, 2<sup>nd</sup> paint coat shall be 10% darker than final color, and the 3<sup>rd</sup> paint coat shall be the final color.
4. All interior/exterior metal handrails, guard rails, stairs, gates, and exterior doors shall be primed and painted by an electrostatic process. The paint shall be specifically formulated for electrostatic application.

## **Section 5: Door Hardware Coordination**

### **A. Hardware**

1. Provide construction cores and keys during the construction period. Construction control, operating keys and cores shall not be part of the COS permanent keying system or furnished on the same keyway (or key section) as the permanent keying system.
2. Permanent cores shall be purchased by the contractor. The manufacturer shall email the COS locksmith at [FMCONTRACTS@SCOTTSDALEAZ.GOV](mailto:FMCONTRACTS@SCOTTSDALEAZ.GOV) to determine core and keyway. COS will install permanent cores and return the construction cores to the contractor.
3. Install factory made steel guards over door latches on park, trailhead, storage and other remotely located building doors.
4. Cores and uncut key blanks shall be sent by the manufacturer via registered mail, return receipt requested to:  
***Locksmith, City of Scottsdale Facilities Department  
9191 San Salvador Drive Scottsdale, Arizona 85258***

## **Section 6: Common HVAC, Plumbing and Electrical Installation Requirements**

### **A. General Requirements**

1. There shall be no duct, conduit, piping, etc. that will interfere with a solar tube having an unobstructed, vertical path from the roof to the ceiling below.
2. There shall be a minimum of 4" clearance between any electrical, plumbing, HVAC, etc. component routed above removable ceiling tiles. There shall be sufficient space in the ceiling cavity to remove ceiling tiles (without damage) when components (such as fire alarm devices, speakers, etc.) are mounted on the ceiling tile.

3. Piping and conduits shall be sleeved through the roof structure with a sleeve sized to allow 1" of clearance around all piping/conduits/insulation, etc. and shall extend a minimum of 12" above the finished roof. Sleeve openings shall be made waterproof.
4. All roof mounted ductwork, piping, and conduits shall be supported by a Unistrut style frame/base and rubber Durablock style sleepers.
5. Piping/conduit penetrations through below ground foundation walls shall be sleeved and provide 1" minimum of clearance. Piping/conduit shall be centered in the sleeve.
6. Piping/conduit routed under building footers shall be sleeved. Sleeves for conduit up to 4" shall be 8". Sleeves for conduit over 4" shall be 6" minimum larger than the conduit(s). Piping/conduit shall be centered in the sleeve. Sleeves shall extend a minimum of 12" past the edge of the footer.
7. All HVAC control and building energy management wire, including thermostat wiring, shall be in conduit.

## **Section 7: HVAC**

### **A. General Requirements**

1. See Plumbing and Electrical sections for other applicable requirements.
2. Triple duty valves shall not serve as isolation valves.
3. All HVAC equipment located above removable ceilings shall be installed no higher than 24" above the ceiling. Isolation valves, disconnect switches, etc. shall be located as close as practicable to the unit.
4. All HVAC equipment requiring regular maintenance located above permanent ceilings shall have a 24"x24" access door and a work platform with a switched light and receptacle.
5. Condensate lines shall be copper, insulated for the first 10' from an indoor unit, and have a union installed within 12" of the condensate outlet.
6. Install check valves where a backflow preventer serves two or more areas. *Example: cooling towers, chilled water loop, etc.*
7. All Split Direct Exchange Systems shall have the refrigerant charge type and weight logged and labeled on the unit. A type written log of these weights shall be included in the close out documents.
8. For systems equal to or greater than 25 tons 1) provide 2" taps with valves on chilled water closed loop systems for system cleaning requirements and 2) provide taps and valves for chilled and condenser water lines for temporary emergency equipment connections. Locate per COS direction.
9. Install 26 gage minimum sheet metal sunshield on all exterior flexible duct connectors
10. Type AX belts shall be installed on all belt driven equipment.
11. Spacers shall be installed (width as required) in between or on the outside edge of air filters to eliminate gaps that allow unfiltered air to reach the coils.

## **Section 8: HVAC Building Automation System**

### **A. System Description**

1. The contractor shall install a complete Wide Area Network (WAN) Automation System (BAS). The Graphic User Interface (GUI) shall be displayable in HTML format, used as a common operating platform for all integrated control systems and shall be the Java-based Niagara N4 Framework. The entire HVAC control system shall be a network of inter-operable, stand alone controllers communicating via BACnet communication protocols.

### **B. Software License Agreement**

1. COS shall sign a copy of the manufacturer's standard software and firmware licensing agreement as a condition of this contract. Such license shall grant COS use of all programs and application software as defined by the manufacturer's license agreement.

### **C. Ownership of Material**

1. COS shall receive ownership of all project software configuration documentation, data files, and application level software. This shall include, but shall not be limited to, all software codes and documentation for configuration and programming that is generated for the project and/or configured for

use within Network Area Controllers, Web server(s), and any related LAN/WAN/Intranet and Internet connected routers and devices. All required IDs and passwords required for access to shall be provided.

#### **D. Training**

1. Upon installation of the BAS Graphic User Interface, the contractor shall provide (1) four hour training session on the BAS and all system integration equipment.
2. After system commissioning, or when COS determines that the BAS hardware and software has achieved an acceptable level of performance, the contractor shall provide (2) four hour training sessions.

#### **D. Network Area Controller Global Control Functions and I/O Summary.**

1. Final control function summary shall be reviewed and approved by COS.

### **Section 9: Plumbing**

#### **A. General Requirements**

1. All potable water lines shall be copper.
2. All water piping under building pads shall be soft drawn Type K with no joints.
3. All above ground water piping shall be hard drawn Type L.
4. All copper piping penetrating concrete floors, pads, etc. shall be sleeved. Sleeves shall extend 4" minimum above the surface of the concrete and shall be one trade size minimum larger than the water pipe it protects. Completely fill the sleeve with a waterproof sealant.
5. All equipment including pumps, water hammers, hose bibs, water heaters, expansion tanks, etc. shall have isolation valves on incoming and outgoing lines. Install valves behind an access door 24" above wall mounted hose bibs. Roof top hose bibs shall have the valve at the hose bib.
6. All equipment piping shall have a brass union between the equipment and its isolation valve.
7. Water closet offsets shall not be used.
8. Air admittance valves may only be used with prior written approval from COS.
9. All cleanouts shall be located in walls.
10. End of the line clean outs shall be provided for the main drainage line and all main branch lines 2" and larger.
11. Cleanouts shall be provided for all urinals and sinks.
12. Urinal cleanouts shall be located directly above the flush valve. All other cleanouts shall be placed at a height so that the cover plate does not overlap the cove base or sheetrock/wall tile. Multiple cleanouts in the same room shall be placed at a uniform height.
13. Clean outs in plumbing chases shall point towards the chase entry.
14. All clean out plugs shall be the raised square style and shall be set to be flush with the stud face. The access opening in the finished wall shall be a minimum of 2" larger in diameter than the clean out plug.
15. All drainage/vent lines shall be DWV rated schedule 40 ABS/PVC.
16. All drainage lines shall have a 2% slope.
17. All drainage main lines under building pads shall have cleanouts a maximum of 75' apart.
18. All below ground, non-glued drainage line sections shall be connected with 4 band shielded connectors.
19. All exposed interior/exterior drainage/vent line sections installed less than 8' AFF and/or subject to damage shall be cast iron.
20. All drainage, vent and water lines shall have a bedding of sand or finely screened native material 4" below and 12" above the pipe.
21. Pipe requiring insulation shall be installed so that the insulation will be set back 1/2" minimum from the stud face. Insulation shall not be removed or reduced to meet this requirement.
22. Pipe insulation shall be continuous and full sized when passing through walls, structural elements, etc.
23. All buildings shall have a double cleanout with a 12"W x 12"D concrete apron.
24. All exterior valve boxes, clean outs, etc. shall have a 12"W x 12"D concrete apron.
25. Test ball access points shall be installed parallel with the wall so they are not confused with clean outs.

26. When waterless urinals are specified, stub out a 3" long capped water line feed with escutcheon plate at the future valve location for a future water line connection. The water line header feeding the urinal(s) shall be controlled by a dedicated valve. The stub out shall be painted to match the wall.
27. All buildings shall have a pressure reducing valve at the main water line building entry point or on the downstream side of the backflow preventer.
28. Hose bibs shall be provided within 15' of all roof top and ground mounted HVAC equipment requiring water for maintenance procedures.
29. Water zone valves shall be grouped in mechanical rooms and/or installed inside wall access panels at 60" AFF.
30. Water heaters shall not be installed higher than 36" AFF.
31. Water and vent lines closer than 1.5" from plywood backer board shall be protected with 16 gage sheet metal.
32. All restroom floor drains shall be fed from the vacuum tube of a water closet/urinal flush valve. Exposed supply tubing shall be chrome plated or flexible braided stainless steel. The tap shall be placed so a minimum amount of exposed tubing between the flush valve and the wall will be installed. Install a 1" diameter, or less, chrome escutcheon plate where the tubing penetrates the wall. One tap shall feed only one floor drain unless approved by COS. All other floor drains shall be fed from an electronic trap primer installed at 60" A.F.F. inside a recessed metal enclosure with stainless steel door and screwdriver latch access. Install the water supply valve inside the enclosure. Surface mount trap primer, receptacle, and water valve on CMU walls. Coordinate with the electrician who shall install A GFCI receptacle inside the enclosure.
33. Electronic ballmakers (per COS detail 2397) shall be placed at all soft copper potable water joints.

## **B. Testing**

1. Underground drainage lines shall be water tested by providing a 10' section of 2" minimum test pipe at the lowest point of the drainage system filled with water for 30 minutes with no drop in water level.
2. All potable water lines shall be hydrostatically tested at 120 PSI for four (4) hours with no drop in pressure.

## **Section 10: Electrical**

### **A. General Requirements**

1. Performing work on energized equipment or circuits is strictly prohibited.
2. All wire shall be copper, wire #12 and larger shall be stranded.
3. All conductors in exposed, exterior conduits greater than 36" in length shall be 90 degree THHW or XHHW-2.
4. All disconnect switches for HVAC equipment shall be fused and heavy duty rated.
5. All conduits with circuits rated 120V or greater entering j-boxes, disconnect switches, etc. through concentric or non-concentric knockouts shall have ground bushings.
6. Conduits under building pads shall have a minimum 6" of backfill above them.
7. Conduit shall be ¾" minimum.
8. Lighting and receptacle branch circuits with a maximum 120V or 277V OCPD rating of 20A shall be in conduit from the branch panel to the first accessible j-box. Stranded wire Metal-Clad Cable (MC) may be used thereafter in concealed spaces only. All MC shall have a full sized equipment ground wire and 600V rated insulation. Anti-short bushings shall be used at all terminations. MC shall be installed parallel and perpendicular to structural elements and shall not have more than four bends (90 degrees maximum per bend) between pull points. MC runs shall be grouped together in a neat, workmanlike manner. All circuits serving motors shall be in conduit.
9. Recessed branch panels shall have (4) ¾" spare conduits stubbed up into an accessible ceiling space.
10. All in-ground pull boxes in landscape areas subject to COS maintenance vehicles shall be traffic rated.
11. All in-ground pull boxes shall have a 12"D x 12"W concrete apron.
12. All wiring connections, splices, etc. inside in-ground pull boxes shall be waterproof.
13. All conduits shall enter in ground pull boxes from the bottom and shall extend 6" minimum into the pull box. Seal conduit entries watertight.
14. All light switch, receptacle and blank cover plates shall be stainless steel.
15. All storage room and closet lighting shall be controlled by wall switch style motion sensors.
16. Receptacles shall be placed 6" (center to center) from adjacent data outlets.

17. PVC shall not be used for exposed interior/exterior conditions.
18. Receptacles requiring GFCI protection shall be GFCI rated. GFCI protection shall not be provided by an upstream GFCI receptacle or circuit breaker.
19. Grounding electrode conductor connections to ground rods, water pipes, building frames, UFER grounds, etc. shall consist of individual runs back to the service entrance ground bus. They shall not be daisy chained.
20. Install a GFCI receptacle inside the electronic trap primer enclosure. See Plumbing section for coordination requirements.

#### **B. Light Poles**

1. All light poles shall have a concrete pull box with tamperproof bolts securing the lid located within 48" of the base. The branch circuit serving the light pole shall be routed from the pull box to the light pole.
2. Install inline fuses in the light pole hand hole. The cover plate shall be secured with tamperproof screws.
3. All circuits entering pull boxes shall have 24" of spare conductor neatly coiled in the box prior to exiting to the next pull box. Secure coils of wire with plastic zip ties.

#### **C. Fire Alarm System**

1. The entire fire alarm wiring system shall be installed in 3/4" minimum (factory colored red) conduit.
2. Install a 2" conduit from the Fire Alarm Radio Dialer to the rooftop antenna location. Extend 24" above roof and install a gooseneck.
3. Antenna support masts for the fire alarm monitoring system shall have a ground clamp attached to the bottom of each. A #6 ground wire shall be daisy chained between the masts and then connected to building steel or shall be run as a dedicated grounding electrode conductor terminated at the service entrance ground bus.

#### **D. Fire Alarm System Monitoring Coordination**

1. COS fire alarm systems are monitored by Municipal Security via the AES Mesh Network and requires all new systems to interface with a radio dialer keyed to a COS licensed frequency.
2. COS shall supply an authorization letter to the contractor to purchase and install the radio dialer.
3. Account information for programming the dialer shall be provided by COS Municipal Security.
4. Signal transmission & zone identification shall be verified by the contractor with COS Municipal Security.
5. Email [FMCONTRACTS@SCOTTSDALEAZ.GOV](mailto:FMCONTRACTS@SCOTTSDALEAZ.GOV) for authorization letter and all contact/coordination information.

#### **E. Existing Fire Alarm System Shut Down Coordination**

1. All COS fire alarm systems are monitored by Municipal Security. Email [MUNICIPALSECURITY@SCOTTSDALEAZ.GOV](mailto:MUNICIPALSECURITY@SCOTTSDALEAZ.GOV) a minimum of three business days (72 hours) prior to a system shutdown. Include your 24 hour contact information, name/address of the building affected, start/stop time/date of the outage, and the reason for the outage. CC the COS Construction Administration Supervisor and Building Inspector on the email.
2. Immediately call **480-312-1990** for emergencies or to report an accidental shut down.

#### **F. Photovoltaic Systems**

1. Exterior wire gutter shall be the ventilated type.
2. All system conductors shall be in dedicated conduits, junction boxes, etc.
3. Multi-conductor cables shall not be used without written pre-approval from COS.

#### **G. Security and Access Control System Coordination**

1. Verify required conduits, sleeve placement through inaccessible spaces, requirements for access control points, sleeve locations, door hinge requirements, cable routing through fire rated walls, device locations, door/door frame access requirements, etc. with the architect/ COS security system installer prior to installation.

## Section 11: Labeling and Identification

### A. Underground Utilities

1. All underground services, including but not limited to, potable water, sewer, gas, electrical, and communications shall be identified with 4" wide, color coded, metal detectable polyester warning tape with wording specifically identifying the utility installed per the table below. Generic yellow plastic warning tape shall not be used.
2. Trenches wider than 24" shall have one additional strip of warning tape, equally spaced, per each additional 12" of width.
3. There shall be warning tape installed for each type of service in the same trench.
4. Replace tape removed during demolition/excavation with new.
5. Warning tape is not required under building pads.
6. Warning tape shall be placed per the following table:

Trench depth	Warning Tape Depth
Up to 24"	6" below grade
Deeper than 24" up to 36"	12" below grade
Deeper than 36"	24" above utility

### B. All Equipment Located Above Grid Ceilings

1. All electrical, mechanical, plumbing, HVAC equipment, etc. located above grid ceilings shall have labels on the ceiling grid with their construction document identification.
2. Fire alarm junction boxes shall be labeled with the zone number(s) the circuiting serves. *Example: "FA Zone 3"*. Circuiting inside the junction box shall have labels indicating which zone they serve. *Example: "2"*.
3. Labels shall have a clear background and black 1/4" minimum letters. *Example: "FCU-1" or "Water Valve #15" or "Exhaust Fan #12"*.
4. All damper handles, water valves, etc. shall have a 12" section of non-flammable warning tape attached to it per the following table:

Item	Color
HVAC duct damper handles	Orange
Potable water valves	Blue
Natural Gas valves	Red

### C. Plumbing and HVAC System Insulated Pipes

1. Insulated piping shall have self-adhesive labels indicating the type of service and an arrow indicating direction of flow. Labels shall be placed at room entry and exit points. Exposed piping shall have labels every 50' and every 20' in accessible ceiling cavities. Exterior piping shall have coil or strap type PVC, UV resistant labels.

### D. HVAC

1. All HVAC equipment shall have a plastic label permanently attached to the equipment disconnect with the equipment name, voltage and panel/circuit number. Exterior equipment shall have a sunlight resistant label. *Example: "AHU-3, 208V, L4-32,34,36"*. Place a duplicate label on the equipment housing if the disconnect is more than 6' from the equipment.
2. All HVAC ducts shall have 4" x24" self-adhesive labels with a yellow background and black letters defining type of duct, the unit serving it and an arrow indicating direction of flow. *Example: "AHU-5 Return Air"*. Labels shall be placed at room entry and exit points. Exposed ducts shall have labels every 100' (per COS direction) and every 20' in accessible ceiling cavities. Labels shall be placed on the bottom of duct. Exhaust fan ducts that route directly up from the unit to the roof do not need labeling.
3. All Split System Direct Exchange Systems shall have a plastic label permanently attached to the equipment with the refrigerant type and charge weight. *Example: "R410A, 4 lbs."*

## E. Electrical

1. Panel schedules shall have specific device and location information matching Construction Document room numbers and room descriptions. Schedules shall be typed or neatly written in block letters.  
*Examples: "Receptacles: offices 101, 102, 103" or "Lighting: south parking lot" or "AHU-4: rooftop"*
2. Circuits in exterior in-ground pull boxes shall be labeled with waterproof labels indicating the circuit number. *Example "16"*
3. Light switch and receptacle cover plates shall be labeled with their panel/circuit numbers. Labels shall have a clear background and black  $\frac{1}{4}$ " letters. *Example: "L-32"*
4. All electrical equipment shall have a plastic label permanently attached to the equipment disconnect with the equipment designation, voltage and panel/circuit number feeding it. Exterior equipment shall have sunlight resistant labels. *Example: " Pump #1, 480V, H1-32,34,36"*
5. Label each grounding electrode conductor connected to the SES ground bus with its connection description and location. *Example: " water pipe, room #107"*
6. Install Arc Flash Warning Labels on the dead front of all electrical panels with information provided by the Electrical Engineer. Labels shall be dated. Submit sample of the label to COS for review prior to installation.

## F. Plumbing

1. Zone valves shall be sequentially numbered with a brass tag beginning with #1 at the main valve. Zone valve access panels shall be labeled. *Example: Water Zone Valves #1 and #2*
2. Isolation or bypass valves on individual pieces of equipment do not need to be labeled.

## Section 12: As Built Drawings

### A. General Requirements

1. The goal is to produce a set of documents so that those who have no prior knowledge of the project can easily find and understand information.
2. As-built drawings shall be maintained daily and kept current during construction.
3. All as-built drawings shall have "As Built" stamped on them.
4. All as-built information added to drawings shall be clearly distinguishable (darker, bolder, etc.) from the base bid information.
5. Handwritten notes, symbols, etc. shall be in black or dark blue ink. Colored ink/pencil notations on drawings shall not be used since they will not be dark enough when scanned and printed in black and white.
6. CADD developed as built drawings may have notes, symbols, etc. in red or other colors that define them from base bid work.
7. All lettering/notes shall be in neatly written (in block letters) so they are readable on a  $\frac{1}{2}$  size set of prints.
8. Added notes, references, clouded areas, etc. shall not block out other relevant information such as dimensions, notes, etc.
9. All notes shall be written with clear and concise wording.
10. Attached drawings, etc. shall be printed dark enough and at a scale that allows them to be readable on a  $\frac{1}{2}$  scale set of prints.
11. Requests for Information (RFIs) that pertain to specifications or other non-drawing items shall be referenced on the first sheet of the discipline it applies to. *Example: "RFI #45: specification section 264500, wiring size" would be on the first electrical sheet.*

### B. RFI Sheets

1. RFIs shall be attached to blank full size sheets and placed at the end of the drawing set. In their numerical order, RFIs shall be placed first, Architectural Supplemental Instructions (ASIs) in the second group, and other drawings in the third group.
2. Place RFIs far enough to the right side of the page to allow information to be read when binding the pages together in a set.
3. RFIs responses that are issued as full size sheets shall replace base bid sheets. These shall be clearly labeled with their RFI number and a note on the RFI reading *"RFI response issued as full size drawing and is in the as built set of drawings"*.



4. All RFIs shall be clearly and legibly referenced on base bid sheets. Indicate the item affected by the RFI with an arrow or area affected by the RFI with a cloud. Include a bullet point description of the RFI.  
*Example: "RFI #122: dimensions"*
5. All supplemental drawings attached to the original RFI shall be clearly labeled with their RFI number
6. Attached drawings, etc. shall be printed dark enough and at a scale that allows them to be readable at ½ size.
7. RFI sheets shall have the RFI numbers that are on the sheet written on leading edge of the sheet starting in the lower right hand corner. *Example: "RFI 15, 16, 17, 18"*
8. If an RFI refers to multiple details/drawings, RFI callouts shall be on all the details/drawings that are referred to in the RFI.

**C. Civil/Utility Drawings**

1. When existing underground utilities are encountered during excavation, document their location with dimensions from two fixed positions, the type of utility, if it was damaged and repaired, if abandoned, and the burial depth. Indicate the general direction of the utility with an arrow.

*Example 1: 4" water @ 36", repaired*

*Example 2: 6" sewer @ 36", 2" fiber optic @ 24"*

*Example 3: 2" electrical @ 24", empty and abandoned*

*Example 4: 1" electrical @ 24", conduit repaired, #12 wires replaced*

2. As-Built Civil drawings shall be stamped by a Registered Land Surveyor.
3. Locate soft copper potable water joints and all irrigation/plumbing, etc. sleeves under roadways, sidewalks, pads, etc. with their sizes and burial depth. *Example: (2) 4"@ 18"*
- 4.

**D. Electrical Riser As Built Drawing**

1. Locate the grounding electrode conductor connection points on the electrical as built drawings. *Example: "water pipe connection to grounding electrode system"* indicate with an arrow to the location.
2. Use an existing or develop a CADD/computer generated electrical riser diagram to show as built conditions that include all parts of the distribution system including transformers and branch panels. Indicate room number/room name next to the equipment. *Example: "Electrical Room 103"*
3. A separate photovoltaic system riser diagram shall clearly define a shutdown sequence of operation
4. Post framed (with a Plexiglass cover) 11"x17" copy of the riser diagram(s) in a room designated by COS. If required for readability, provide larger, framed drawings. COS to review and approve drawings prior to framing and posting.

**E. Plumbing Riser As Built Drawing**

1. Use an existing or develop a CADD/computer generated waste water riser and potable water riser diagrams to show as built conditions that include all fixtures, clean out locations, numbered valves, water lines, etc. Draw a box around fixture clusters and identify with room name/number, indicate location of individual items such as drinking fountains and clean outs. Include in the as-built drawing set.
2. Post framed (with a Plexiglass cover) 11"x17" copies of the riser diagrams in a room designated by COS. If required for readability, provide larger, framed drawings. COS to review and approve drawings prior to framing and posting.

**F. Plumbing Video**

1. To verify that drainage lines are clear and free from construction debris, dips, damage, etc., all main drainage lines 3" and larger shall be videotaped from their end of the line cleanout to where the line intersects with a larger drain line and/or where it connects to the manhole servicing the building. Branch lines 3" and larger and over 25' feet are required to be videotaped.
2. Use the plumbing waste line riser diagram to make a map of the drainage lines required to be videotaped. Color code and label runs (Run 1, 2, etc.) on the riser diagram. Insert image of the riser diagram at the beginning of each video clip of each pipe section videotaped. Title video clips to match the riser diagram. *Example: "Run #1, east/west main drain line"*.
3. If remedial work is determined to be required after the initial videotaping, re-videotaping is required to confirm that remedial work was successful. Do not include video clips of failed sections in the final plumbing DVD.

**G. Final As-Built Review, Drawings, and DVDs**

1. Prior to final DVD submittal, provide (1) 11" x17" size set of As-Built drawings for COS review and comment. Update and resubmit as required until final approval by COS. Return all drawings, etc. with COS comments.
2. As applicable, provide final copies of As Built documents and DVDs per the table below. All individual PDF files within folders shall be labeled to clearly indicate their unique content. Do not use abbreviations or single letter designations to label files.
3. DVDs shall be re-writable. Label each DVD with project name, COS project number and the phrase "As Built Documents"

Item	# Required
<b>Final As Built Drawing submittal to include hard copies of the following:</b>	
SWPPP Project Binder: See below for contents.	1 binder
11" x 17" set of As Built drawings	2 sets
Warranty and Inspections: See below for contents. Label 3 ring binder with project name, year issued, COS project number and the phrase "Warranty and Inspections"	1 binder
Final As Built DVDs shall include the following PDFs/folders labeled exactly as shown in <b>bolded</b> text and in the exact order below:	
<b>As Built Drawings</b> As Built drawing PDF files shall be grouped by discipline (mechanical, structural, RFI, etc.) in individual folders. Folders shall have individual PDF files for each drawing. <u>Do not</u> combine multiple sheets into one PDF file. Drawing files shall be labeled with their sheet number and drawing description to match the drawing index. <i>Example: "S7.05: roof framing details"</i>	Folder
<b>Construction Drawing CADD Files</b> Provided by the architect	Folder
<b>DS&amp;PM Design Checklist</b> Provided by the architect	PDF
<b>RFIs and ASIs</b> This folder shall include individual PDF files of all final versions of RFIs and ASIs.	Folder
<b>Project Specifications and Soils Report</b> Specification sections shall be in individual PDF files and labeled with their specification number and content that match the specifications. <i>Example: "221116: domestic water piping"</i>	Folder
<b>O&amp;M Manuals</b> This folder shall be divided into product division folders (Mechanical, Electrical, etc.) Contents within those folders shall be broken down into individual PDF files. Major pieces of equipment (such as chillers) shall have their own PDF file. Similar, smaller equipment (such as light fixtures) may be grouped into a single PDF file. PDF files shall be 25 pages maximum unless the pages all refer to the same piece of equipment.	Folder
<b>Approved Product Submittals</b> This folder shall have individual PDF files of the final, approved product submittals.	Folder
<b>SWPPP Binder</b> This folder shall also include all SWPPP inspection reports	Folder
<b>Warranty and Inspections</b> This folder shall include the folders listed below in the exact order shown: <b>Contact Information:</b> Contractor/ subcontractor contact information <b>Warranties:</b> Certificate of substantial completion and contractor/subcontractor warranties <b>Inspections:</b> Third party inspection reports including, but not limited to, County or State inspections, Fire Marshal, water meter, backflow inspections, water quality, asbestos abatement, electrical testing, elevator, pest control, boiler, the Final HVAC Test and Balance Report, lowest floor verification certificate, etc. <u>Do not</u> include O&M product warranty information, county air quality or geotechnical reports. <b>Training:</b> COS Owner Training session sign-in sheets	Folder

<b>Split Direct Exchange System Refrigerant Type/Charge Weight Log</b> See Section 7 for requirements	PDF	
<b>HVAC Equipment Warranty Registration</b> This folder shall have extended warranties (more than 1 year) for all HVAC equipment components such as compressors, etc. See specifications for those items. These shall be registered by the contractor with the manufacturer. Copies of these registrations and a registration summary sheet for all components with the unit names, serial numbers, the components warranted and the warranty expiration dates shall be included.	Folder	
<b>Plumbing Videos</b> See Section 12 for requirements	Folder	
<b>Training Videos</b> As required per specifications	Folder	
<b>Paint Color Chart</b> This file shall be a chart identifying final paint colors, paint sheen and general locations used. Include the manufacturer's name if the color is not on the approved paint color chart in the COS Design Standards and Policy Manual (DS&PM).	PDF	
<b>Separate DVD</b>		
Building Automation System backup data/software		1 DVD

## Section 13: Preferred Products

### A. Prior Approval

- For products or catalog numbers not listed, refer to the project specifications. When a preferred manufacturer is listed and the acceptable alternate is named as "May Submit", alternates must meet or exceed the functional ability and quality of construction of the preferred manufacturer's product. Approval of those alternate products shall be per the sole discretion of COS. **Manufacturers and products listed in this section take precedence over those listed in other specification sections.**

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
<b>Section 3: Roofing</b>				
Modified Bitumen system	Derbigum		Firestone Johns-Manville	
<b>Section 4: Interior</b>				
Paper towel dispenser	ASI	8522	Bobrick B-2860 May Submit: Stainless Steel, manual feed Keylock (must match ASI/Bobrick key)	
Paper towel dispenser/waste receptacle	ASI	04692-9	Bobrick B-39619 May Submit: Stainless Steel, manual feed Keylock (must match ASI/Bobrick key)	
Toilet paper dispenser	ASI	0040	Bobrick B-2892 May Submit: Stainless Steel, Twin jumbo roll, Keylock (must match ASI/Bobrick key)	
Hand soap dispenser	ASI	5001-SS	Bobrick B-26627 May Submit: Stainless Steel, Keylock (must match ASI/Bobrick key)	
Sanitary napkin disposal	ASI	Royal Series 20852	Bobrick B-270 May Submit: Stainless Steel	
Baby changing station	ASI	9013-9	May Submit: Stainless Steel	
Adult changing station	Foundations	100-SSE	May Submit: Stainless Steel	
Hand Dryer	ASI	0197-93	Excel TA-SB May Submit: Surface mount, Satin/Brushed Stainless Steel	
Wall/ceiling access doors				Stainless Steel with screwdriver latches
Building signage				As applicable, all interior/exterior building signage shall comply with the Scottsdale Signage Guidance Manual. Email <a href="mailto:FMCONTRACTS@SCOTTSDALEAZ.GOV">FMCONTRACTS@SCOTTSDALEAZ.GOV</a> to request a digital copy.
<b>Section 5: Hardware/Gates</b>				
All finishes shall match Best #626				
Hinges	Stanley	661HD	Roton, Hager	Continuous hinge heavy duty exterior doors
	Stanley	CB199xNRP	Roton, Hager	Heavy duty exterior doors
	Stanley	CB168	Roton, Hager	Heavy duty interior doors
	Stanley	CB179	Roton, Hager	Medium duty interior doors
	Stanley	CECB179-66	NONE	Electric
Exterior Locksets	Best	45H	NONE	45H mortise series x 15H trim

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
	Best	45HW7DEU-IDH-LMS	NONE	Electric
	Best	9K DEU	NONE	Electric, power supply by Best
Interior Locksets	Best	9K Cylindrical Series	NONE	15D lever, S3 strike package
	Von Duprin	RXS1	NONE	RX switch for electric lockset
	Securitron	TSBC	NONE	Door loop for electric lockset
Key System	Best	7pin removable core cylndr	Standard Peaks	Keyway shall be designated by COS
Closing Device	LCN	4041	NONE	EDA arms on all exterior and heavy traffic doors
ADA Open/Closing Device	LCN	LCN4642		Include pushbuttons and MS Sedco kit
Exit device	Von Duprin	99E, 99 Rim	NONE	Lever trim for electric lockset, Trim defined by COS
Mullions	Von Duprin	KR4954	NONE	Standard door, size and finish determined by COS
Mullions	Von Duprin	KR 9954	NONE	Fire door
Deadbolts	Best	83T series	NONE	Individual door function to be defined by COS
Door Stop	Trimco	1220-5	May Submit	Kick down type
Wall Bumpers	Trimco	1270CV	May Submit	Concave center
Storefront framing				Med. 6" style, 10" top/bottom frame, welded inner joints
Overhead doors	Overhead Door		May Submit	Commercial grade, 100,000 cycle springs
Door operator	Overhead Door	OPRSX50001B	May Submit	Trolley or jackshaft version per architectural plans
Automatic rolling gate	Hy Security	Trailhead gates: Slide Smart Series H-D15 All other locations: Slide Driver Hydraulic Series	May Submit	Gates shall have an electric motor (with soft start and stop) and hydraulic drive. The operator shall be sized for a gate 50% heavier than the gate installed. The controller shall be equipped with a remote release to allow the motor wheels to disengage without the need to open the motor enclosure cabinet which shall be fully sealed to prevent rodent access, wireless safety edges shall not be allowed
Automatic rolling gate controller	Optex	OVS-01GT	May Submit	3 sensors
<b>Section 7: HVAC</b>				
Cooling Tower water treatment control panel	Lakewood	2175-RTC	NONE	1500 Series controller may be used per architectural direction
Pumps				Back pull out style, end suction, close coupled base mounted
Evaporative coolers	United Metal	Low Static:Fan Air High Static:Cel Air	May Submit	Stainless steel with automatic flushing system, CELdek or Glasdek media
Diffusers				Step down style
Unit filters				Pleated, 2" minimum
Boilers	Parker		May Submit	Proposed boiler alternate shall have local manufacturer's representation, local availability of parts and no proprietary maintenance or service restrictions
<b>Section 7: HVAC Building</b>	System components shall be provided by one of the three manufacturers and installed by one of the approved local contractor/representative listed below. System components include all			

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
<b>Automation System</b>	operator workstation software, controller software, custom application programming language/controllers, and specific/custom application controllers. The front end Jace shall be Niagara N4.			
System Components	Distech Controls	BACnet series	NONE	Approved Local Contractor: Climatec Mechanical Products BAS, Inc.
System Components	Johnson Controls: Facility Explorer	BACnet series	NONE	Approved Local Contractor: IMCOR (RSD Total Control)
System Components	Automated Logic	WebCTRL series	NONE	Approved Local Contractor: Integrated Controls
<b>Section 8: Plumbing</b>				
Water closet: wall mount	Kohler	K-4325	American Std. 2294.011EC May Submit	
Water closet: floor mount	American Std.	3461.001	Kohler K-96057-SSL May Submit	
Flush valves: water closet (manual)	Moen	8310M16 (1.6 GPF)	Sloan Royal 111-1.28 (1.28 GPF) May Submit	
Urinal	American Std.	6590.001	Zurn Z5755-U May Submit	
Flush valves: urinal (electronic)	Moen	8315 (0.5 GPF)	Sloan Royal 186-0.5 (0.5 GPF) May Submit	
Lavatories: Drop in, cast iron	Proflow	PF20174	Kohler K2196-4 May Submit	
Lavatories: Wall mount, cast iron	Kohler	K2867	American Std. 4869.004 May Submit	
Faucets: lavatory (metering)	Moen	8886	Delta 86T1153 May Submit	
Faucets: kitchen	Moen	8701	Delta 100LF-HDF (single handle) May Submit	
Faucets: kitchen (Fire Stations ONLY)	Grohe	33755SD1	May Submit	
Faucets: bar	Fisher	84808-3525	T&S B-1141-XSCR4V15 May Submit	
Faucets: mop	Chicago	897-RCF	Proflow PF1119 May Submit	
Exposed p-traps				Chrome with clean out
Hose bibs	Woodford	24P	May Submit	¾"
Angle stops	Chicago	STC-31-00-AB	May Submit	¼ turn, loose key
Disposals ¾ HP (with power cord)	Insinkerator	Evolution Compact	Moen GT75C May Submit	
Backflow preventers	Febco	825Y or 825YA	NONE	2" and smaller piping with upstream brass strainer
Backflow preventers	Watts	909	NONE	3" and larger piping with upstream brass strainer
Shower valves	Moen	2590	May Submit	Integral stops with L2352 trim
Water hammer	Watts	LF15M2	May Submit	Pressure charged type
Water heaters	Naview	NPE Series	May Submit	Natural Gas Tankless (when applicable)

Item	Preferred Manufacturer	Catalog Number	Acceptable Alternate	Comments
Storm Water and Sewage Ejector Pumps	Flyght	For pits 48" and greater in depth	May Submit	With separate receiving basin to catch solids, rail system and controller. May Submit different manufacturers for pits less than 48" in depth
Floor drains	Zurn		JR Smith May Submit	Shall have strainers and (if no trap primer) trap guards
Roof drains	Zurn		JR Smith May Submit	Nickel bronze grate, removable sediment bucket
Drinking fountains	Elkay	EZST18WS	May Submit	Interior, with bottle filler
Drinking fountains	MDF	493-18	May Submit	Exterior, with hose bib and pet fountain
Pet fountains	MDF	370SM	May Submit	Blue in color
Trap primer tap	Sloan	F-72-A1	May Submit	Tapped off water closet/urinal vacuum tube
<b>Section 9: Electrical</b>				
Building Fire Alarm System	Honeywell: Firelite	ECC 50/100 Series (for voice notification systems)  ES200X (for non-voice notification systems)	NONE	The fire alarm system shall be able to be programmed and serviced without the need of proprietary access codes from the manufacturer and/or vendors
Building Fire Alarm Radio Monitor	AES	7707P-88-ULP-M	NONE	Letter required from COS to purchase. See section 9.D for instructions. Leave WIFI USB inside the FACP
IT Room Fire Alarm System	Kidde	Aries Series	May submit	Proposed system alternate shall be able to fully interface with the building fire alarm system and shall be able to be programmed and serviced without the need of proprietary access codes from the manufacturer and/or vendors
Emergency Generator	Kohler: w/ AMP Series Control Panel		Cummins: w/PCC Series Control Panel or May Submit.	Proposed generator/control panel alternates shall be fully compatible (without field modifications to the generator control panel) with the Generator Monitoring Module and the existing COS generator monitoring system. Proposed alternate shall have local manufacturer's representation, local parts availability and no proprietary maintenance or service restrictions. Program generator to exercise for 15 minutes every Tuesday at 9am with no power transfer to the building.
Generator Monitoring Module	OmniMetrix	TrueGuard PRO	NONE	Required for all control panels. Email <a href="mailto:FMCONTRACTS@SCOTTSDALEAZ.GOV">FMCONTRACTS@SCOTTSDALEAZ.GOV</a> to coordinate module purchase, installation and connection to the remote monitoring system
Elevators and Wheelchair Lifts				Proposed systems shall have local manufacturer's representation, local parts availability and no proprietary maintenance or service restrictions.
Panelboards				All branch panels 600A and smaller shall have hinged dead fronts

## Section 14: Spare Parts

This chart does not supersede providing spare parts from other specification sections. If duplicate items are specified in those sections, the more stringent requirement shall take precedence. See Section 13: Preferred Products chart or other specification sections for manufacturer/catalog numbers not shown. Provide spare parts, in their original packaging, and deliver to COS at substantial completion.

Equipment	Number required based on Building Square Feet			Comments
	Up to 10K sq. ft.	10K+ sq. ft. to 25K sq. ft.	Over 25K sq. ft.	
<b>Paint</b>	5 gallons	10 gallons	15 gallons	Five gallon containers, color/sheen per COS direction
<b>Section 5: Hardware</b>				
Door Stop	5	5	5	Floor mount
Wall Bumpers	5	5	5	Wall mount
Cylindrical Locks	2	5	5	Best #9347AB15D53 (no substitutions)
Universal Mortise Locks	2	5	5	Best #45H7UNR15H (no substitutions)
Padlocks	5	5	10	Best # 21BL722L (Approved Equal: Cormax)
<b>Section 9: Plumbing</b>				
Water closet flush valve repair kit	5	10	15	
Water closet flush valve	1	2	3	
Urinal flush valve repair kit	5	10	15	
Urinal flush valve	1	2	3	