BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 24-10954 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter - Chief of Party (Surveying & Layout)	5/1/2021		$41.42	$15.49	$56.91
Carpenter - Instrument Person (Surveying & Layout)	5/1/2021		$36.02	$15.49	$51.51
Carpenter - Rodman I (Survey & Layout)	5/1/2021		$28.82	$12.39	$41.21
Carpenter - Rodman II (Survey & Layout)	5/1/2016		$18.69	$13.83	$32.52
Carpenter	5/1/2023		$35.32	$19.09	$54.41
Carpenter	5/1/2024		$36.12	$19.79	$55.91
Carpenter	5/1/2025		$36.87	$20.49	$57.36
Carpenter	5/1/2026		$37.63	$21.18	$58.81
Carpenter Welder	5/1/2023		$36.07	$19.09	$55.16
Carpenter Welder	5/1/2024		$36.87	$19.79	$56.66
Carpenter Welder	5/1/2025		$37.62	$20.49	$58.11
Carpenter Welder	5/1/2026		$38.38	$21.18	$59.56
Carpenters - Piledriver/Welder	1/1/2023		$36.07	$19.09	$55.16
Carpenters - Piledriver/Welder	1/1/2024		$36.87	$19.79	$56.66
Carpenters - Piledriver/Welder	1/1/2025		$37.62	$20.49	$58.11
Carpenters - Piledriver/Welder	1/1/2026		$38.38	$21.18	$59.56
Cement Finishers	1/1/2017		$27.70	$22.20	$49.90
Dockbuilder, Pile Drivers	5/1/2023		$50.48	$37.99	$88.47
Dockbuilder, Pile Drivers	5/1/2024		$52.98	$37.99	$90.97
Dockbuilder, Pile Drivers	5/1/2025		$55.23	$37.99	$93.22
Dockbuilder, Pile Drivers	5/1/2026		$56.98	$37.99	$94.97
Dockbuilder/Pile Driver Diver	5/1/2023		$58.41	$41.74	$100.15
Dockbuilder/Pile Driver Diver	5/1/2024		$61.54	$41.74	$103.28
Dockbuilder/Pile Driver Diver	5/1/2025		$64.35	$41.74	$106.09
Dockbuilder/Pile Driver Diver	5/1/2026		$66.54	$41.74	$108.28
Dockbuilder/pile driver tender	5/1/2023		$50.48	$37.99	$88.47
Dockbuilder/pile driver tender	5/1/2024		$52.98	$37.99	$90.97
Dockbuilder/pile driver tender	5/1/2025		$55.23	$37.99	$93.22
Dockbuilder/pile driver tender	5/1/2026		$56.98	$37.99	$94.97
Electric Lineman	5/29/2023		$51.40	$29.62	$81.02
Electric Lineman	6/3/2024		$52.80	$30.61	$83.41
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2023		$36.26	$31.38	$67.64
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	7/1/2024		$37.26	$32.63	$69.89
Laborers (Class 01 - See notes)	5/1/2023		$24.81	$18.99	$43.80
Laborers (Class 01 - See notes)	5/1/2024		$25.61	$19.49	$45.10
Laborers (Class 02 - See notes)	5/1/2023		$31.43	$18.99	$50.42
Laborers (Class 02 - See notes)	5/1/2024		$32.23	$19.49	$51.72
Laborers (Class 03 - See notes)	5/1/2023		$28.42	$18.99	$47.41
Laborers (Class 03 - See notes)	5/1/2024		$29.22	$19.49	$48.71
Laborers (Class 04 - See notes)	5/1/2023		$28.77	$18.99	$47.76
Laborers (Class 04 - See notes)	5/1/2024		$29.57	$19.49	$49.06
Laborers (Class 05 - See notes)	5/1/2023		$29.44	$18.99	$48.43
Laborers (Class 05 - See notes)	5/1/2024		$30.24	$19.49	$49.73

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 24-10954 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 06 - See notes)	5/1/2023		$28.86	$18.99	$47.85
Laborers (Class 06 - See notes)	5/1/2024		$29.66	$19.49	$49.15
Laborers (Class 07 - See notes)	5/1/2023		$29.15	$18.99	$48.14
Laborers (Class 07 - See notes)	5/1/2024		$29.95	$19.49	$49.44
Laborers (Class 08 - See notes)	5/1/2023		$29.63	$18.99	$48.62
Laborers (Class 08 - See notes)	5/1/2024		$30.43	$19.49	$49.92
Millwright	6/1/2023		$41.51	$23.33	$64.84
Millwright	6/1/2024		$43.46	$23.33	$66.79
Millwright	6/1/2025		$45.46	$23.33	$68.79
Millwright	6/1/2026		$47.52	$23.33	$70.85
Operators (Heavy, Class 01 - See Notes)	5/1/2023		$41.14	$28.82	$69.96
Operators (Heavy, Class 01 - See Notes)	5/1/2024		$42.30	$29.66	$71.96
Operators (Heavy, Class 01 - See Notes)	5/1/2025		$43.46	$30.50	$73.96
Operators (Heavy, Class 01 - See Notes)	5/1/2026		$44.61	$31.35	$75.96
Operators (Heavy, Class 01A - See Notes)	5/1/2023		$43.39	$29.48	$72.87
Operators (Heavy, Class 01A - See Notes)	5/1/2024		$44.55	$30.32	$74.87
Operators (Heavy, Class 01A - See Notes)	5/1/2025		$45.71	$31.16	$76.87
Operators (Heavy, Class 01A - See Notes)	5/1/2026		$46.86	$32.01	$78.87
Operators (Heavy, Class 02 - See Notes)	5/1/2023		$40.86	$28.73	$69.59
Operators (Heavy, Class 02 - See Notes)	5/1/2024		$42.02	$29.57	$71.59
Operators (Heavy, Class 02 - See Notes)	5/1/2025		$43.18	$30.41	$73.59
Operators (Heavy, Class 02 - See Notes)	5/1/2026		$44.34	$31.25	$75.59
Operators (Heavy, Class 02A - See Notes)	5/1/2023		$43.11	$29.40	$72.51
Operators (Heavy, Class 02A - See Notes)	5/1/2024		$44.27	$30.24	$74.51
Operators (Heavy, Class 02A - See Notes)	5/1/2025		$45.43	$31.08	$76.51
Operators (Heavy, Class 02A - See Notes)	5/1/2026		$46.59	$31.92	$78.51
Operators (Heavy, Class 03 - See Notes)	5/1/2023		$37.95	$27.86	$65.81
Operators (Heavy, Class 03 - See Notes)	5/1/2024		$39.11	$28.70	$67.81
Operators (Heavy, Class 03 - See Notes)	5/1/2025		$40.26	$29.55	$69.81
Operators (Heavy, Class 03 - See Notes)	5/1/2026		$41.43	$30.38	$71.81
Operators (Heavy, Class 04 - See Notes)	5/1/2023		$36.80	$27.54	$64.34
Operators (Heavy, Class 04 - See Notes)	5/1/2024		$37.96	$28.38	$66.34
Operators (Heavy, Class 04 - See Notes)	5/1/2025		$39.12	$29.22	$68.34
Operators (Heavy, Class 04 - See Notes)	5/1/2026		$40.28	$30.06	$70.34
Operators (Heavy, Class 05 - See Notes)	5/1/2023		$36.35	$27.41	$63.76
Operators (Heavy, Class 05 - See Notes)	5/1/2024		$37.51	$28.25	$65.76
Operators (Heavy, Class 05 - See Notes)	5/1/2025		$38.67	$29.09	$67.76
Operators (Heavy, Class 05 - See Notes)	5/1/2026		$39.83	$29.93	$69.76
Operators (Heavy, Class 06 - See Notes)	5/1/2023		$35.48	$27.14	$62.62
Operators (Heavy, Class 06 - See Notes)	5/1/2024		$36.64	$27.98	$64.62
Operators (Heavy, Class 06 - See Notes)	5/1/2025		$37.80	$28.82	$66.62
Operators (Heavy, Class 06 - See Notes)	5/1/2026		$38.96	$29.66	$68.62
Operators (Heavy, Class 07A - See Notes)	5/1/2023		$49.93	$32.83	$82.76
Operators (Heavy, Class 07A - See Notes)	5/1/2024		$51.39	$33.77	$85.16

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 24-10954 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Heavy, Class 07A - See Notes)	5/1/2025		$52.85	$34.71	$87.56
Operators (Heavy, Class 07A - See Notes)	5/1/2026		$54.32	$35.64	$89.96
Operators (Heavy, Class 07B - See Notes)	5/1/2023		$49.58	$32.73	$82.31
Operators (Heavy, Class 07B - See Notes)	5/1/2024		$51.04	$33.67	$84.71
Operators (Heavy, Class 07B - See Notes)	5/1/2025		$52.51	$34.60	$87.11
Operators (Heavy, Class 07B - See Notes)	5/1/2026		$53.97	$35.54	$89.51
Operators (Highway, Class 01 - See Notes)	5/1/2023		$40.25	$28.55	$68.80
Operators (Highway, Class 01 - See Notes)	5/1/2024		$41.41	$29.39	$70.80
Operators (Highway, Class 01 - See Notes)	5/1/2025		$42.56	$30.24	$72.80
Operators (Highway, Class 01 - See Notes)	5/1/2026		$43.72	$31.08	$74.80
Operators (Highway, Class 01a - See Notes)	5/1/2023		$42.50	$29.23	$71.73
Operators (Highway, Class 01a - See Notes)	5/1/2024		$43.66	$30.07	$73.73
Operators (Highway, Class 01a - See Notes)	5/1/2025		$44.81	$30.92	$75.73
Operators (Highway, Class 01a - See Notes)	5/1/2026		$45.97	$31.76	$77.73
Operators (Highway, Class 02 - See Notes)	5/1/2023		$39.08	$28.20	$67.28
Operators (Highway, Class 02 - See Notes)	5/1/2024		$40.24	$29.04	$69.28
Operators (Highway, Class 02 - See Notes)	5/1/2025		$41.39	$29.89	$71.28
Operators (Highway, Class 02 - See Notes)	5/1/2026		$42.55	$30.73	$73.28
Operators (Highway, Class 03 - See Notes)	5/1/2023		$38.39	$27.99	$66.38
Operators (Highway, Class 03 - See Notes)	5/1/2024		$39.55	$28.83	$68.38
Operators (Highway, Class 03 - See Notes)	5/1/2025		$40.70	$29.68	$70.38
Operators (Highway, Class 03 - See Notes)	5/1/2026		$41.87	$30.51	$72.38
Operators (Highway, Class 04 - See Notes)	5/1/2023		$37.94	$27.86	$65.80
Operators (Highway, Class 04 - See Notes)	5/1/2024		$39.10	$28.70	$67.80
Operators (Highway, Class 04 - See Notes)	5/1/2025		$40.26	$29.54	$69.80
Operators (Highway, Class 04 - See Notes)	5/1/2026		$41.41	$30.39	$71.80
Operators (Highway, Class 05 - See Notes)	5/1/2023		$37.42	$27.72	$65.14
Operators (Highway, Class 05 - See Notes)	5/1/2024		$38.58	$28.56	$67.14
Operators (Highway, Class 05 - See Notes)	5/1/2025		$39.73	$29.41	$69.14
Operators (Highway, Class 05 - See Notes)	5/1/2026		$40.89	$30.25	$71.14
Operators (Highway, Class 06 - See Notes)	5/1/2023		$40.48	$28.62	$69.10
Operators (Highway, Class 06 - See Notes)	5/1/2024		$41.64	$29.46	$71.10
Operators (Highway, Class 06 - See Notes)	5/1/2025		$42.80	$30.30	$73.10
Operators (Highway, Class 06 - See Notes)	5/1/2026		$43.95	$31.15	$75.10
Operators (Highway, Class 06/A - See Notes)	5/1/2023		$42.73	$29.28	$72.01
Operators (Highway, Class 06/A - See Notes)	5/1/2024		$43.89	$30.12	$74.01
Operators (Highway, Class 06/A - See Notes)	5/1/2025		$45.05	$30.96	$76.01
Operators (Highway, Class 06/A - See Notes)	5/1/2026		$46.21	$31.80	$78.01
Operators (Highway, Class 07/A - See Notes)	5/1/2023		$48.86	$32.51	$81.37
Operators (Highway, Class 07/A - See Notes)	5/1/2024		$50.32	$33.45	$83.77
Operators (Highway, Class 07/A - See Notes)	5/1/2025		$51.79	$34.38	$86.17
Operators (Highway, Class 07/A - See Notes)	5/1/2026		$53.25	$35.32	$88.57
Operators (Highway, Class 07/B - See Notes)	5/1/2023		$47.44	$32.10	$79.54
Operators (Highway, Class 07/B - See Notes)	5/1/2024		$48.91	$33.03	$81.94

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 24-10954 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators (Highway, Class 07/B - See Notes)	5/1/2025		$50.37	$33.97	$84.34
Operators (Highway, Class 07/B - See Notes)	5/1/2026		$51.84	$34.90	$86.74
Painters Class 1 (see notes)	5/1/2018		$23.92	$14.37	$38.29
Painters - Line Stripping	12/1/2023		$42.10	$27.43	$69.53
Painters Class 2 (see notes)	5/1/2023		$29.15	$17.54	$46.69
Painters Class 2 (see notes)	5/1/2024		$29.72	$18.08	$47.80
Painters Class 3 (see notes)	5/1/2023		$34.90	$17.54	$52.44
Painters Class 3 (see notes)	5/1/2024		$35.47	$18.08	$53.55
Piledrivers	5/1/2023		$35.32	$19.09	$54.41
Piledrivers	5/1/2024		$36.12	$19.79	$55.91
Piledrivers	5/1/2025		$36.87	$20.49	$57.36
Piledrivers	5/1/2026		$37.63	$21.18	$58.81
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		$48.43	$40.28	$88.71
Truckdriver class 1(see notes)	5/1/2021		$37.72	$0.00	$37.72
Truckdriver class 2 (see notes)	5/1/2021		$37.79	$0.00	$37.79

SECTION 01 12 00 - MULTIPLE CONTRACT SUMMARY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes a summary of each contract, including responsibilities for coordination and temporary facilities and controls.

B. Specific requirements for Work of each contract are also indicated in individual Specification Sections and on Drawings.

C. Related Requirements:

1. Section 01 10 00 "Contract Summary" for the Work covered by the Contract Documents, restrictions on use of Project site, phased construction, coordination with occupants, and work restrictions.
2. Section 01 31 00 "Project Management and Coordination" for general coordination requirements.
3. Section 01 50 00 “Temporary Facilities and Controls” for Prime Contractor responsibilities.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, the condition at which building envelope is insulated and weathertight; exterior walls are insulated and weathertight; and openings are closed with permanent construction or substantial temporary closures equivalent in weather protection to permanent construction.

1. Substantial temporary closures shall at a minimum be 5/8” exterior plywood within wood frame, with minimum of 6” thick batt insulation.
2. Window openings may be enclosed with minimum 10 mil reinforced poly fabric.

1.4 PROJECT COORDINATOR

A. Project Coordinator shall be responsible for coordination between the General Construction Contract, Plumbing Contract, HVAC Contract, Electrical Contract and Owner provided services by Owner’s forces and work by other entities on site.

1. General Construction Contractor shall act as Project Coordinator.

B. Mechanical/Electrical Coordinator, who shall be under the direction of Project Coordinator, shall be responsible for coordination between the Plumbing Contract, HVAC Contract, Electrical Contract and Owner provided services by Owner’s forces and separate contracts indicated.

C. Mechanical Contractor shall act as Mechanical/Plumbing/Electrical Coordinator.

1. Scheduling: The General Contractor shall retain scheduling consultant to coordinate the scheduling activities of the multiple contracts, to prepare an overall project schedule, and to monitor and update Project schedule periodically.

1.5 PROJECT COORDINATOR RESPONSIBILITIES

A. Project coordinator shall perform Project coordination activities for the multiple contracts, including, but not limited to, the following:

1. Provide typical overall coordination of the Work.
2. Coordinate shared access to workspaces.
3. Coordinate product selections for compatibility.
4. Provide overall coordination of temporary facilities and controls.
5. Coordinate construction and operations of the Work with work performed by each Contract.
6. Prepare coordination drawings in collaboration with each contractor to coordinate work by more than one contract, except those indicated to be the responsibility of the Mechanical/Electrical Coordinator.

    a. Oversee and review preparation of Coordination Drawings to insure contract requirements are met and properly sequenced.
    b. Implement the requirements of the Coordination Drawings.

7. Coordinate sequencing and scheduling of the Work. Include the following:

    a. Initial Coordination Meeting: No later than 30 days after NTP is issued, arrange and conduct a meeting with all contractors for sequencing and coordinating the Work; negotiate reasonable adjustments to schedules.
    b. Prepare a combined contractors' construction schedule for entire Project. Base schedule on the Milestone Schedule provided in section 00 31 13. Secure time commitments for performing critical construction activities from contractors. Show activities of each contract on a separate sheet. Prepare a simplified summary sheet indicating combined construction activities of contracts.

        1) Submit schedules for approval.

    c. Distribute copies of approved schedules to contractors.

8. Provide quality-assurance and quality-control services specified in Section 01 40 00 "Quality Requirements."
9. Coordinate sequence of activities to accommodate all tests and inspections, and coordinate schedule of tests and inspections, including those required by local, county, state and federal agencies.
10. Provide progress cleaning of common areas and coordinate progress cleaning of areas or pieces of equipment where more than one contractor has worked, including but not limited to, mud and debris from vehicles and equipment leaving site. Progress cleaning shall be performed on a daily basis.
11. Provide final professional cleaning of building.
12. Coordinate cutting and patching.
13. Coordinate protection of the Work.
14. Coordinate the installation of fireproofing with the work of other trades.

    a. Coordinate the work to require the minimum amount of fireproofing removal and patching.

15. Coordinate the installation concealed blocking and supports for work of all primes.
16. Coordinate the sequence of work to the benefit of the project schedule.
17. Coordinate firestopping.
18. Coordinate completion of interrelated punch list items.
19. Coordinate preparation of Project Record Documents if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
20. Print and submit Record Documents if installations by more than one contractor are indicated on the same Contract Drawing or Shop Drawing.

21. Collect record Specification Sections from contractors, collate Sections into numeric order, and submit complete set.
22. Coordinate preparation of operation and maintenance manuals if information from more than one contractor is to be integrated with information from other contractors to form one combined record.
23. Coordinate installation, shared use, and removal of temporary facilities.

B. Responsibilities of Project coordinator for temporary facilities and controls include, but are not limited to, the following:

1. Provide common-use field office to include furniture, power, equipment and janitorial service for temporary trailers as described in Section 01 50 00 “Temporary Facilities and Controls” for use by all personnel engaged in construction activities.

C. Mechanical/Electrical Coordinator: Full-time HVAC/Plumbing/Electrical Coordinator shall be experienced in coordination of type of operations required for this project. Coordination activities include, but are not limited to, the following:

1. Schedule and sequence all HVAC, plumbing and electrical activities.
2. Coordinate sharing access to workspaces by HVAC, plumbing and electrical contractors.
3. Coordinate integration of HVAC, plumbing and electrical work into limited spaces.
4. Coordinate protection of HVAC, plumbing and electrical contractors' work.
5. Coordinate cutting and patching for HVAC, plumbing and electrical work.
6. Prepare HVAC, plumbing and electrical coordination drawings, in collaboration with all contractors as described in Section 01 33 00 “Project Management and Coordination” and as follows.

a. Coordination drawings among the HVAC, Plumbing, Electrical and General Construction Contractors as required with the lead role assigned to the Mechanical Contractor. The Mechanical Contractor shall prepare 3/8” scale CADD or REVIT drawing with ductwork and piping layout for review by other Prime Contractors. The other Prime Contractors shall then prepare and provide CADD or REVIT additions/modifications representing their work to the Mechanical Contractor, who will then prepare final layout and coordination drawings illustrating work by all Trades on one set of coordination drawings for the project as a part of this Contract Price. The HVAC Contractor shall conduct coordination meeting with all Prime Contractors to discuss and resolve interference problems. Once each Prime Contractor has initialed with approval the coordination drawings, the HVAC Contractor shall submit the coordination drawings to the Architect for review. The other prime contractors shall finalize their shop drawing in accordance with the coordination drawings and submit to the Architect.

1) Schedule: The HVAC Contractor shall prepare and distribute ductwork drawings after all equipment is approved and within 45 days of Owner’s Notice to Proceed is issued. The Mechanical Contractor shall coordinate with the Prime Contractor prior to distribution to other trades. Sequence of distribution shall be from Mechanical Contractor to Plumbing Contractor to Electrical Contractor. The other Prime Contractors shall then prepare and distribute to the Mechanical Contractor their Revit input within 14 days of receipt. Within 14 days of its receipt of the coordination drawings from the Electrical and Plumbing Contractors, the HVAC Contractor shall schedule a coordination meeting with all Prime Contractors to resolve remaining conflicts, Once approved by Architect/Engineer, the HVAC Contractor shall provide a color copy of the coordination drawings to Owner’s Rep for use on site.
2) Coordination Drawing Organization: Organize coordination drawings as follows:

a) Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire protection, fire alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
b) Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on

Drawings. Indicate areas of conflict between light fixtures and other components.

c) Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire protection, fire alarm, and electrical equipment.

d) Structural Penetrations: Indicate penetrations and openings required for all disciplines.

e) Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.

f) HVAC and Plumbing Work: Show the following:

(1) Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
(2) Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
(3) Fire-rated enclosures around ductwork.

g) Electrical Work: Show the following:

(1) Runs of vertical and horizontal conduit 1-1/4 inch diameter and larger.
(2) Light fixture, exit light, emergency battery pack, smoke detector, and other fire alarm locations.
(3) Panel board, switch board, transfer switches, transformer and generator locations.
(4) Location of pull boxes and junction boxes, dimensioned from column center lines.
(5) Telecom racks and cable tray runs.

h) Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are the Contractor's responsibility. If the Architect determines that the coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, the Architect will so inform the Contractor, who shall make changes as directed and resubmit.

i) Coordination Drawing Prints: Prepare coordination drawing prints in accordance with requirements of Division 01 Section "Submittal Procedures."

7. Coordinate temporary services and facilities with other prime contractors.

8. Coordinate tests and inspections for HVAC, plumbing and electrical work so as not to negatively impact the work of other prime contractors.
   a. Coordinate time of rough-in inspections with General Contractor to ensure that HVAC, plumbing and electrical work does not affect schedules for finish work.

1.6 GENERAL REQUIREMENTS OF CONTRACTS

A. Extent of Contract: Unless the Agreement contains a more specific description of the Work of each Contract, requirements indicated on Drawings and in Specification Sections determine which contract includes a specific element of Project.

1. Unless otherwise indicated, the work described in this Section for each contract shall be complete systems and assemblies, including products, components, accessories, and installation required by the Contract Documents.
2. To the extent that the work of all the contracts represents a complete and integrated whole, each prime contractor shall become thoroughly familiar with all of the construction documents. Work of a particular contract shall be substantially located on the documents referenced below, but such references do not relieve each contractor for responsibility to provide work in compliance with requirements on all the documents as follows:

a. Information contained on any construction document shall be enforceable on each contractor as indicated on drawings, by reference to contractor designations (GC, PC, MC and EC).
b. Dimensional information on the Architectural drawings that relates to the work of a particular contract shall be the responsibility of that contractor to install the item where located.

1) In the absence of specific dimensional information on the Architectural plans for exposed items provided by the HVAC, Plumbing and Electrical Contracts, consult Architect for decisional requirements before installing exposed item.

c. In cases of conflicts, assignment of responsibilities shall be at the sole interpretation of the Architect.

3. Local custom and trade-union jurisdictional settlements do not control the scope of the Work of each contract. When a potential jurisdictional dispute or similar interruption of work is first identified or threatened, affected contractors shall negotiate a reasonable settlement to avoid or minimize interruption and delays.
4. Trenches and backfill for the Work of each contract shall be provided by each contract for its own work unless noted otherwise.

a. Trenches for work within the building and 5 feet perimeter shall be provided by each contractor requiring the work.
b. Trenches for work outside the 5 feet building perimeter shall be provided by the Site and Athletic Contractor unless specifically noted to be provided by others.

5. Blocking, backing panels, sleeves, and metal fabrication supports for the work of each contract shall be the work of each contract for its own work.
6. Concrete related to the work of each contract shall be provided by each contract for its own work, except as noted below, and shall be governed by the requirements of Division 03 Section “Concrete”.

a. Each Prime Contractor shall install “housekeeping” and “equipment support” pads for their respective work. Coordinate dimensions and installation requirements with respective Prime Contractor.

7. Support work as specified in Division 05 Section “Metal Fabrications” to connect work of each contract to the structural system shall be provided by each contractor for its own work.

a. Support work shall include reinforcements welded within steel joists, as indicated on the structural drawings, for point loads on steel joists.

8. Furnishing of access doors, frames or panels for the work of each contract shall be the work of each contract for its own work. Installation of access panels shall be the work of each contract for its own work. All proposed access panel locations shall be reviewed with the Architect prior to installation.
9. Concealed sealants for the Work of each contract shall be provided by each contractor for its own Work.
10. Painting for the work of each contract shall be the work of the General Construction Contract.

a. Exposed MEP systems shall be painted. Refer to Section 09 91 23 “Interior Painting”.

11. Cutting and Patching: Each Prime Contractor shall perform its own cutting and patching unless noted otherwise.

a. Patching of finish work for each contract shall be coordinated with the General Contractor.

12. Through-penetration firestopping for the work of each contract shall be provided by each Contractor for its own work.
13. Protections for the work of each contract shall be provided by each Contractor for its own work.
14. Comply with scheduling and coordination requirements as indicated in the General Conditions.

15. Each contractor is responsible to provide temporary protection from the weather and temperature for all openings in the building required for their work.
16. Each contractor is responsible for all means and methods to hoist any items required for their work.
17. Contractors' Startup Construction Schedule: Within five working days after startup horizontal bar-chart-type construction schedule submittal has been received from Project Coordinator, submit a matching startup horizontal bar-chart schedule and startup network diagram showing construction operations sequenced and coordinated with overall construction.
18. Project close out requirements.

B. Substitutions: Each contractor shall cooperate with other contractors involved to coordinate approved substitutions with remainder of the Work.

1. Project Coordinator shall coordinate substitutions.
2. Substitutions will not be permitted after contract award, except as noted in Section 01 25 00 “Substitution Procedures”.

    a. All submittals shall be copied to the Project Coordinator.

C. Temporary Facilities and Controls: In addition to specific responsibilities for temporary facilities and controls indicated in this Section and in Section 01 50 00 "Temporary Facilities and Controls," each contractor is responsible for the following:

1. Installation, operation, maintenance, and removal of each temporary facility necessary for its own normal construction activity, and costs and use charges associated with each facility, except as otherwise provided for in this Section.
2. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
3. Its own field office, complete with necessary furniture, utilities including internal power distribution from external disconnect box, and telephone service.
4. Its own storage and fabrication sheds.
5. Temporary enclosures for its own construction activities.
6. Staging and scaffolding for its own construction activities.
7. All hoisting facilities for its own construction activities, including hoisting material or equipment into spaces below grade, and hoisting requirements outside building enclosure.
8. Waste disposal facilities, including collection and legal disposal of its own hazardous, dangerous, unsanitary, or other harmful waste materials.
9. Progress cleaning of work areas affected by its operations on a daily basis.
10. Secure lockup of its own tools, materials, and equipment.
11. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.
12. Generators for powering welders.
13. Generators for equipment requiring three phase power. This shall also include temporary power for 3-phase permanent equipment that must be tested before connection to and/or availability of permanent power supply.

D. Temporary Heating, Cooling, and Ventilation: The General Construction Contract is responsible for temporary heating, cooling, and ventilation for the duration of the project.

1. Permanent systems may not be used for temporary heating and dehumidifying. Owner will consider allowing use of the permanent HVAC equipment for temporary heat once its ready for start-up and provided building conditions are maintained clean and dust free.
2. Refer to Section 01 50 00 “Temporary Facilities and Controls”.

E. Temporary Electrical Power Service, Distribution and Lighting:

1. Contractors may not utilize the existing electrical system from the existing adjacent school for construction related activities.
2. The Site and Athletic Contractor shall furnish and install a metered temporary electric service that is appropriately sized for all the construction related activities.
3. Electrical Contractor shall coordinate the location of temporary service panel with the Site and Athletic Contractor.

4. The Site and Athletic Contractor to provide temporary electric power within 30 days of Notice to Proceed or provide trucked in power for staging area and office trailers until utility provided power is established.
5. The installation and removal of electric service for the Staging area is the responsibility of the Site and Athletic Contractor. The Site and Athletic Contractor shall coordinate with the local utility and pay all associated fees.

    a. Site and Athletic Contractor is responsible for the installation of required poles, lines and equipment needed to supply power to the main temporary service panel in the Staging area. Coordinate locations of any required poles and equipment with General Contractor.

F. Temporary Water Distribution Piping: Plumbing Contractor is responsible for temporary distribution piping from tanker and new service when available. Include connections to the new service, when available, and electric pumps to raise water to required levels from temporary tanker water source.

1. Hoses may only be used for water distribution if connected to General Contractor supplied tanks.

G. Temporary Water Service: General Construction Contractor is responsible for provision of truck mounted tank water supply until time that connection can be made to the new water service.

H. Telephone Service: Electrical Contractor is responsible to bring telephone and data service lines to the Staging Area capable of supporting all temporary usage as described in Section 01 50 00. Electrical Contractor to coordinate telephone and data service requirements with other Prime Contractors. General Construction Contractor is responsible for installation and maintenance of temporary telephone and data lines throughout construction period for Temporary Field Offices for Owner's Representative as described in Section 01 50 00.

I. Use Charges: Refer to Section 01 50 00 "Temporary Facilities and Controls".

J. Other Temporary Facilities and Controls: Unless specifically assigned otherwise in this Section, other temporary facilities and controls are the responsibility of the General Construction Contractor.

1.7 GENERAL CONSTRUCTION CONTRACT (GC)

H. Work in the General Construction Contract includes architectural, structural construction plus other construction operations traditionally recognized as General Construction. It also includes administrative and coordination responsibilities. Work under this Prime Contract includes, but is not limited to, the following:

1. Existing building selective demolition.
2. Foundations, building pad, including footings, underpinning, and foundation walls.
3. Slabs-on-grade, including earthwork, subdrainage systems, and insulation.
4. Below-grade building construction, including excavation, backfill, and thermal and moisture protection.
5. Miscellaneous metal work including intermediate supports for mechanical, electrical and plumbing equipment.
6. Exterior closure, including walls, doors, and windows.
7. Gutters and downspouts - Site Contractor to provide downspout boots and all leaders extending from downspout boots.
8. Interior construction, including partitions, doors, and fittings.

    a. Door hardware and coordination with security system provider, including all associated low voltage wiring between doors and power supply.
9. Fire-protection specialties.
10. Stairs, including railings and finishes.
11. Interior finishes, finish carpentry architectural woodwork and built-in casework.
12. Miscellaneous items, including painting of exposed mechanical and electrical work.
13. Exposed sealants.
14. Edge of slab and top of wall fire resistive joint systems.

15. Firestopping for openings not related to work of other contracts.
16. Equipment, including the following:

    a. Visual display surfaces.
    b. Residential appliances.
    c. Fire extinguisher cabinets.
    d. Equipment specified, not specifically noted to be provided by another contract.
    e. Installation of Owner provided equipment.

17. Furnishings, including pre-manufactured casework.
18. Lintels required for HVAC, plumbing, electrical, shall be provided by the Prime Contractors doing that work.
19. Metal drip edge.
20. Each Prime Contractor is responsible for coordinating size and location for all openings required to accommodate work in their scope.
21. Remaining work not identified as work under other contracts.
22. All work covered in Divisions 01 through 12 these specifications.

I. Temporary facilities and controls in the General Construction Contract include, but are not limited to, the following:

1. Temporary facilities and controls that are not otherwise specifically assigned to the Plumbing Contract, Mechanical Contract, and Electrical Contract.
2. Unpiped temporary toilet fixtures, wash facilities, and drinking water facilities, including disposable supplies.
3. Temporary enclosure for building exterior.
4. Dewatering facilities and drains.
5. Excavation support and protection, unless required solely for the Work of another contract.
6. Project identification and temporary signs.
7. General Contracotr to provide waste facilities (dumpsters) for all Prime Contractors.
8. Pest control.
9. Temporary stairs.
10. Temporary fire-protection facilities.
11. Barricades, warning signs, and lights.
12. General hoisting facilities for material and personnel.
13. Covered walkways, when needed to provide safe access to occupied areas in the building.
14. Security enclosure and lockup, including fencing and gates.
15. Environmental protection.
16. Safety measures.
17. Snow and ice removal.
18. Temporary heating, ventilation and humidity control.
19. Temporary facilities as indicated in Division 01, Section “Temporary Facilities and Controls.”
20. Temporary dust proof partitions.

1.8 PLUMBING CONTRACT (PC)

A. Work in the Plumbing Contract shall include all labor, material, equipment, and services necessary for the complete construction of plumbing, drainage Work and Work of other piped systems shown on the P- and FP- drawings and described in Divisions 00, 01, 02, 20, and 22 of the Specifications. Refer to other Sections of the Specifications for the installation and execution of incidental work (example: Earthwork and Concrete). The Plumbing Contract includes, but is not limited to, the following:

1. Provide a construction layout for all work under this contract.
2. Site Utilities, the Plumbing Contractor shall be responsible for the following Utilities as they enter the building, including making connections between the site and building lines:

    a. Domestic Water: PC shall extend water lines from the building out 5’ from building perimeter.
    b. Sanitary: PC shall extend sanitary service out 5’ from building perimeter.
    c. Storm: PC shall provide all storm line tie-ins out 5’ from building perimeter.

d. Gas: PC shall take gas line into building from Meter.

3. Sanitary waste from five feet beyond the building perimeter into the building, including connection to the sanitary sewer work provided under the General Contract. All hook-up and connection requirements within a five-foot perimeter of the building are the responsibility of the Plumbing Contractor.
4. Plumbing fixtures, including wall hydrants on exterior walls.
5. Domestic water distribution and fire protection system components.
6. Domestic hot/cold water systems.
7. Sanitary waste and vent systems within the building-to-building perimeter as defined on plans and to include tie-in with site utility as indicated above.
8. Flushing, sanitizing and water quality testing for water distribution systems.
9. Cutting and patching as required for installation of plumbing systems and equipment.
10. Plumbing connections to equipment furnished by the General Construction Contract, Plumbing Contract, Mechanical Contract and Electrical Contract.
11. Lintels as required for Plumbing Scope.
12. All work covered in Divisions 01, 20, and 22 of these specifications.
13. Coordination with Commissioning Agent.
14. Composite coordination drawings.
15. Natural gas piping and system components.

B. Temporary facilities and controls in the Plumbing Contract include, but are not limited to, the following:

1. Piped temporary sewers and drainage.
2. Plumbing connections to temporary facilities and controls furnished by the General Construction Contract, Plumbing Contract, HVAC Contract and Electrical Contract.
3. Temporary facilities as indicated in Section 01 50 00 “Temporary Facilities and Controls.”
4. Installation, operation, maintenance, and removal of each temporary facility considered as its own normal construction activity, and costs and use charges associated with each facility.
5. Plug-in electric power cords and extension cords, supplementary plug-in task lighting, and special lighting necessary exclusively for its own activities.
6. Its own field office, if needed.
7. Its own storage and fabrication sheds.
8. General hoisting facilities for its own construction activities.
9. Waste disposal facilities for its own hazardous or harmful waste.
10. Progress cleaning of its own areas on a daily basis.
11. Secure lockup of its own tools, materials, and equipment.
12. Construction aids and miscellaneous services and facilities necessary exclusively for its own construction activities.

1.9 HEATING, VENTILATING AND AIR CONDITIONING CONTRACT (MC)

A. Work in the Heating, Ventilating, and Air-Conditioning Contract includes all labor, material, equipment and services necessary for the complete construction of all the heating, ventilating, and air-conditioning system and the temperature control system Work and Work of other ducted systems shown on M- series drawings and described in Division 00, 01, 02, 20 and 23 of the Specifications. Refer to other Sections of the Specifications for the installation and execution of incidental work (example: Earthwork and Concrete). Work under this Prime Contract includes, but is not limited to, the following:

1. Provide construction layout for all work under this contract.
2. HVAC piping systems, including:

    a. Hydronic distribution.
    b. Refrigerant piping.
    c. Associated pumps.
    d. Specialties and accessories.

3. Heat generation

    a. Wall Mounted Condensing Boilers

4. Refrigeration, including:

    a. Condensing Units.

5. HVAC distribution.

    a. Supply, return, and exhaust.
    b. Terminal outlets and accessories.
    c. Fans.

6. Terminal and packaged units, including:

    a. VRF Heat Pump System.
    b. Ductless Split Systems.
    c. Unit Heaters.
    d. Finned radiation.
    e. Electric Ceiling Panel Heaters.
    f. Energy Recovery Ventilators.

7. Air-Handling Equipment.
8. HVAC instrumentation and controls.
9. HVAC testing, adjusting, and balancing.
10. Temperature Control Systems, including control wiring.
11. Start-up of HVAC systems, controls and equipment.
12. Provision of labor and materials as outlined for rough-ins and final connections associated with the installation of the Kitchen Equipment.
13. HVAC connections to equipment furnished by the General Construction Contract, the Plumbing Contract, the Mechanical Contract and the Electrical Contract.
14. Cutting and patching as required for installation of HVAC systems and equipment.
15. All work covered in Divisions 00, 01, 02 20 and 23 of these specifications.
16. Coordination with Commissioning Agent.

B. Temporary Heating, Cooling, and Ventilation: The General Construction Contract Project Coordinator is responsible for temporary heating, cooling, and ventilation.

    1. Use of permanent equipment may be permitted by Owner if in accordance with contract requirements. Upon project completion, all equipment shall be serviced; all filters changed. Warranties may not go into effect until Substantial Completion of the building or its systems.

1.10 ELECTRICAL CONTRACT (EC)

H. Work in the Electrical Contract shall include all labor, material, equipment and services necessary for the complete construction of all electrical Work shown on the E- series drawings and described in Divisions 00, 01, 02, 20, 26, 27 and 28 of the Specifications unless noted otherwise. Scope includes but is not limited to, the following:

    1. Provide construction layout for all work under this contract.
    2. Electrical power service and distribution, including required disconnect switches at equipment requiring power.
    3. Lighting, branch wiring and fixtures.
    4. Electrical grounding
    5. Fire detection and alarm systems including wiring and connections for duct detectors.
    6. Data, voice, security, CATV and communications systems.

        a. Preparation of rough-in details required for coordination of hardware and security systems.

    7. Testing and adjusting of electrical systems and equipment.
    8. Starting of electrical systems and equipment.

9. Provision of labor and materials as outlined for rough-ins and final connections associated with the installation of the Appliances.
10. Provision and installation of equipment pads, including generator and transformer pads, for equipment required under this contract.
11. Special electrical systems, including the following:

    a. Packaged engine generator systems.
    b. Data systems.
    c. Communication systems.
    d. Security System –intrusion detection and access control.
    e. Surveillance camera system.
    f. Audio visual rough-in and wiring. Coordination with Owner equipment provider and installer.

12. Cutting and patching as required for installation of electrical systems and equipment.
13. Electrical connections to equipment furnished by the General Construction Contract, Plumbing Contract, Mechanical Contract, and Electrical Contract.
14. Coordination with Commissioning Agent.

I. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:

1. Electrical connections to temporary facilities and controls furnished by the General Construction Contract, Plumbing Contract, Mechanical Contract and Electrical Contract.
2. Temporary emergency electrical systems, including but not limited to lighting and egress lighting.
3. Temporary facilities as indicated in Division 01, Section “Temporary Facilities and Controls.”

1.11 SITE AND ATHLETICS CONSTRUCTION CONTRACT (LandTEK)

A. Site Development including all exterior sitework, site improvements, and storm water management; Site utilities identified as required from 5 feet outside the building perimeter. The Site Contract includes but is not limited to all work shown on the Site Development Drawings, and includes all site work, including but not limited to all clearing, cut and fill, grading, excavation and backfill and work associated with Domestic Water, Storm Water and Sanitary Sewer utilities, and as set forth below:

1. Notification of Municipal Offices, County Conservation and Utility Companies as required prior to starting work.
2. Provide all fees, permits and inspections as required to perform all work. Owner shall obtain and pay for the Building Permit.
3. Water, stormwater and sanitary utilities shall be connected at five feet from the building perimeter, unless noted otherwise. Connection of these utilities is the responsibility of the Prime Contractor under whose contract the utility is required from the building.
4. Trenching, installation and backfilling of excavation for sanitary sewer, storm water management, new water lines including fire lines.
5. Trenching and backfilling for installation of new gas line. Installation of Gas Line shall be by the Utility.
6. All site improvement work designated more than five feet or beyond the perimeter of the project building is the responsibility of the Site Contractor, unless specifically noted otherwise.

    a. Electrical site work shall be performed by the Electrical Contractor unless noted otherwise:

        1) All conduit and junction boxes, including trenching and excavation for the conduit, outside the footprint of the field and track Electrical Site Plans, shall be provided by the Electrical Contractor.

7. Coordinate, schedule, and approve interruptions of permanent and temporary utilities, including those necessary to make connections for temporary services.
8. Provide information necessary to adjust, move, or relocate existing utility structures affected by construction.
9. Locate existing permanent benchmarks, control points, and similar reference points, and establish permanent benchmarks on Project site.
10. Provide field surveys of in-progress construction and site work.

11. Construction layout and land surveying services required for all work required under the General Contract, including all control points and elevations required for other prime contractors to locate and layout work required for their contract without engaging an independent surveyor.
12. Site preparation, including clearing, building demolition and relocations, and earthwork.
13. Site improvements, including roadways, parking lots, pedestrian paving, site development furnishings and equipment, and landscaping.

    a. Restoration of site following all trenching required for installation of utilities.

14. Tunnels for site utilities.
15. Site utilities, the Site Contractor shall contact, coordinate and provide connections to the following Utilities as follows:

    a. Water and Fire: Site Contractor shall bring water and fire service to 5' of building perimeter, include pressure testing.
    b. Gas: Site contractor shall provide trenching for third party to install gas line to meter.
    c. Sanitary: Site contractor shall bring sanitary service to 5' of building perimeter.
    d. Storm: Site contractor shall provide all storm line tie-ins to 5' of building perimeter, including supply downspout boot and make tie-in from point of boot connection.

16. Athletic scope including track, field, turf scope.

17. Temporary facilities and controls in the Electrical Contract include, but are not limited to, the following:
    a. Electrical connections to temporary facilities and controls furnished by the General Construction Contract, Plumbing Contract, Mechanical Contract and Electrical Contract.

1.12 BLEACHER CONTRACT (Stadium Solutions – noted on Arch Drawings as 'Owner Contractor)

A. Bleacher related scope as listed below:

1. Fabricate, deliver, and install new 'T' shaped brackets that attach to the face of the existing grandstand risers (staggered from the existing fastener's locations).
2. Fabricate, deliver, and install the metal bleacher ramps, stairs, decks, and guardrail system including concrete foundations.
3. Fabricate, deliver and install the new front walkway deck including guardrail system and understructure support, including fascia to close off the existing concrete deck.
4. Fabricate, deliver, and install new Press Box 12' x 30' with filming platform to the GC installed structure.
5. Fabricate, deliver, and install new Press Box landings and angle frame support attached to existing concrete deck. Includes guardrail system with vinyl closure. Includes downspout system to grade or boot from the new Press Box.
6. Fabricate, deliver, and install closure of sides of the new Press Box understructure with siding.
7. Fabricate, deliver, and install mid aisle handrails, deck mounted on both Home and Visitor bleacher structures.

1.13 STADIUM LIGHTING (MUSCO)

A. Stadium lighting fixture upgrades and lighting controls.

B. Softball lighting Alternate.

1.14 SCOREBOARD (NEVCO)

H. New scoreboard.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 12 00

SECTION 01 21 00 – UNIT-COST ALLOWANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements governing allowances.

1. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Contractor. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Unit-cost allowances.

C. Related Requirements:

1. Section 01 22 00 "Unit Prices" for procedures for using unit prices.
2. Section 01 26 00 “Contract Modifications” for procedures for submitting and handling change orders for allowances.
3. Section 01 40 00 "Quality Requirements" for procedures governing the use of allowances for testing and inspecting.
4. Divisions 02 through 33 for items of work covered by allowances.

1.3 SELECTION AND PURCHASE

A. At the earliest practical date after award of the Contract, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.

B. At Architect's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.

C. Purchase products and systems selected by Architect from the designated supplier.

1.4 ACTION SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.

B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.

C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 UNIT-COST ALLOWANCES

A. Unit-Cost Allowances shall include cost to Contractor of specific products and materials ordered by Owner or selected by Architect under allowance and shall include taxes, freight, and delivery to Project site.

B. Unless otherwise indicated, Contractor's costs for receiving and handling at Project site, labor, installation, overhead, profit and bonds, and similar costs related to products and materials selected by Architect under allowance shall be included as part of the Contract Sum and not part of the allowance.

C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.

1. If requested by Architect, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed. Otherwise, disposal of unused material is contractor’s responsibility.

1.8 ADJUSTMENT OF ALLOWANCES

A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place based on the Unit Price listed for the actual quantity used in the work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

3.3 SCHEDULE OF UNIT-COST ALLOWANCES

A. In accordance with the instructions specified in applicable Specification Sections and as may be further indicated on the Drawings, the Contractor responsible for the applicable allowance shall include the cost

for the allowance (unit price multiplied by the allowance quantity) in the Base Bid. The allowance quantities listed shall be in addition to those required to complete the Work of the Contract and, consequently, the cost for the allowance shall be deducted from the Contract amount by change order if the corresponding allowance work is not required by actual conditions encountered.

B. MASONRY (To be included in the General Construction Contract Base Bid Only)

1. Material Allowance No. 4A – Masonry Repointing

   a. In addition to masonry repointing indicated within the Contract Documents, include 200 square feet of brick masonry repointing wall area as directed by the Architect. Assume areas will be installed in small quantities (+-10 L.F.) as required.
   b. Comply with requirements for Division 04 Section 04 20 00 “Unit Masonry”.
   c. Coordinate the quantity allowance with the unit-price requirements in Section 01 22 00 “Unit Prices”.

C. PLUMBING: (To be included in the Plumbing Construction Contract Base Bid Only)

1. Material Allowance 22A – Domestic Water Pipe.

   a. Description: In addition to the work shown on the drawings and specifications, provide and install additional domestic water pipe, insulation, hangers, fittings, etc., for the following pipe sizes and quantities in accordance with Unit Price 22A (Base Bid Materials):

¾”	50 LF	5 fittings	2 valves
1”	50 LF	5 fittings	2 valves
2”	50 LF	5 fittings	2 valves
3”	50 LF	5 fittings	2 valves

2. Material Allowance 22B – Above Ground Soil, Waste, Vent Piping.

   a. Description: In addition to the work shown on the drawings and specifications, provide and install additional aboveground soil, waste, and vent pipe, hangers, fittings, etc. for the following pipe sizes and quantities in accordance with Unit Price 22B (Base Bid Materials):

1 ½”	50 LF	2 fittings
2”	50 LF	2 fittings

3. Material Allowance 22C – Underground Soil, Waste, Vent Piping.

   a. Description: In addition to the work shown on the drawings and specifications, provide labor, material, excavation, backfill, to install additional underground soil, waste, and vent pipe, fittings, etc. for the following pipe sizes and quantities in accordance with Unit Price 22C (Base Bid Materials):

2”	50 LF	5 fittings
4”	50 LF	5 fittings
6”	50 LF	5 fittings

4. Material Allowance 22D – Underground Storm Drainage Piping within 5 feet of building.

   a. Description: In addition to the work shown on the drawings and specifications, provide labor, material, excavation, backfill, to install additional underground storm drainage pipe, fittings, etc. for the following pipe sizes and quantities in accordance with Unit Price 22D:

3”	50 LF	5 fittings
4”	50 LF	5 fittings
6”	50 LF	5 fittings

D. HVAC: (To be included in the HVAC Construction Contract Base Bid Only)

1. Material Allowance 23A – Hydronic Pipe.

a. Description: In addition to the work shown on the drawings and specifications, provide and install additional hydronic pipe, insulation, hangers, fittings, etc., for the following pipe sizes and quantities in accordance with Unit Price 23D:

¾"	50 LF	5 fittings	5 valves
1"	50 LF	5 fittings	5 valves
1 ¼"	50 LF	5 fittings	5 valves
1 ½"	50 LF	5 fittings	5 valves
2"	50 LF	5 fittings	5 valves

E. ELECTRICAL: (To be included in the Electrical Construction Contract Base Bid Only)

1. Material Allowance 26A –Additional 20 AMP Duplex Receptacles:

a. Description: In addition to the work shown on the drawings and specifications, provide and install a total of ten (10) additional duplex receptacle outlets each including outlet box, wall plate, 100' of concealed wire (2-#12 and 1-#12 ground) in a ¾" EMT conduit and connection to spare branch circuit protective device in a panel board in accordance with Unit Price 26A.

2. Material Allowance 26 B – Additional 20 AMP Rated Wire and Conduit:

a. Description: In addition to the work shown on the drawings and specifications, provide and install ten (10) additional electrical connections each including 100 lineal feet of concealed (2 #12 and #12 ground) wire in ¾" EMT conduit, terminations at nearest panelboard and at an electrical device or electrical equipment. Include all testing and labeling. Conduit supports shall be as per Specifications. Make all connections necessary for complete and fully functional installation in accordance with Unit Price 26B.

3. Material Allowance 26 C – Exit Signs:

a. Description: In addition to the work shown on the drawings and specifications, provide and install four (4) additional exit sign assemblies, appropriate mounting equipment, up to 200 lineal feet of concealed wire (2 #10 and 1 #10 ground) in ¾" EMT conduit and all terminations and connections. Connect to closest normal/emergency life safety circuit in accordance with Unit Price 26C.

4. Unit Price No. 28A – Smoke Detector.

a. Description: In addition to the work shown on the drawings and specifications, provide and install a total of three (3) additional fire alarm initiating devices which will include the following: one smoke detector unit and backbox as specified; 50 linear feet of ¾" EMT conduit, cabling, terminations and connections to the fire alarm system and programming required in accordance with Unit Price 28A.

END OF SECTION 01 21 00

SECTION 01 22 00 - UNIT PRICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for unit prices.

B. Related Sections:

1. Section 01 21 00 “Unit-Cost Allowances”.
2. Section 01 26 00 "Contract Modification Procedures" for procedures for submitting and handling Change Orders.
3. Section 01 40 00 "Quality Requirements" for general testing and inspecting requirements.
4. Divisions 02 through 33 Sections for items of work covered by Unit Prices.

1.3 DEFINITIONS

A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for additional materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

A. Unit prices include all necessary labor and material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.

1. Unit Price must cover the entire cost of Work.

B. Measurement and Payment: Refer to individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.

C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.

D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

1.5 PAYMENT

A. Payment Includes: Full compensation for all required labor, Products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; supervision, overhead and profit.

B. Final payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities accepted by the Owner multiplied by the unit price for Work which is incorporated in or made necessary by the Work as adjusted as may be permitted under the requirements of this Section or other conditions of the Contract.

1.6 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the sole opinion of the Owner, it is not practical to remove and replace the Work, the Owner will direct one of the following remedies:

1. The defective Work may remain, but the unit sum/price will be adjusted to a new price at the discretion of the Owner
2. The defective Work will be partially repaired to the instructions of the Owner, and the unit price will be adjusted to a new sum/price at the discretion of the Owner.

C. The individual specification sections may modify these options or may identify a specific formula or percentage price reduction.

D. The authority of the Owner to assess the defect and identify payment adjustment is final.

1.7 NON-PAYMENT FOR REJECTED PRODUCTS

A. Payment will not be made for any of the following:

1. Products wasted or disposed of in a manner that is not acceptable.
2. Products determined as unacceptable before or after placement.
3. Products not completely unloaded from the transporting vehicle.
4. Products placed beyond the lines and levels of the required Work.
5. Products remaining on hand after completion of the Work.
6. Loading, hauling, and disposing of rejected Products.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. GENERAL CONSTRUCTION to be provided by General Construction Contractors only:

1. Unit Price No. 3A – Concrete Spall Repair

a. Description: Provide repairs per detail on Structural Drawing A/S1.2 as directed by the Architect. Assume repairs will be in small quantities (+-1 S.F.).
b. Comply with requirements for Division 03 Section 03 01 30 “Maintenance of Cast-In-Place Concrete”.
c. Unit of Measurement: Per Square Foot

2. Unit Price No. 3B – Concrete Crack Repair

a. Description: Provide repairs per detail on Structural Drawing B/S1.2 as directed by the Architect. Assume repairs will be in small quantities (+-1 S.F.).

b. Comply with requirements for Division 03 Section 03 01 30 “Maintenance of Cast-In-Place Concrete”.
c. Unit of Measurement: Per Square Foot

3. Unit Price No. 4A – Masonry Repointing

a. Description: Provide repointing per Structural Drawing details as directed by the Architect. Assume repairs will be in small quantities (+-1 S.F.).
b. Comply with requirements for Division 04 Section 04 20 00 “Unit Masonry”.
c. Unit of Measurement: Per Square Foot

4. Unit Price No. 4B – Underpinning

a. Description: Provide foundation underpinning cost per Structural Drawing details as directed by the Architect. Assume repairs will be in small quantities (+-3 L.F.).
b. Comply with requirements for Division 04 Section 04 20 00 “Unit Masonry”.
c. Unit of Measurement: Per Lineal Foot

B. PLUMBING to be provided by Plumbing Construction Contractors only:

1. Unit Price No. 22A – Domestic Water Pipe as Noted.

a. Description: Provide and install additional domestic water pipe, insulation, hangers, fittings, etc., for the following pipe sizes:
b. Comply with requirements for Division 22 Section 22 11 16 “Domestic Water Piping”.
c. Unit of Measurement: Linear Foot.

1.	¾”	$	LF	$	per fitting	$	per valve
2.	1”	$	LF	$	per fitting	$	per valve
3.	2”	$	LF	$	per fitting	$	per valve
4.	3”	$	LF	$	per fitting	$	per valve

2. Unit Price No. 22B – Aboveground Soil, Waste, Vent Piping as Noted.

a. Description: Provide and install additional aboveground soil, waste, and vent pipe, hangers, fittings, etc. for the following pipe sizes:
b. Comply with requirements for Division 22 Section 22 13 16 “Sanitary Waste and Vent Piping”
c. Unit of Measurement: Per Linear Foot.

1.	1 ½”	$	LF	$	per fitting
2.	2”	$	LF	$	per fitting

3. Unit Price No. 22C – Underground Soil, Waste, Vent Piping as Noted.

a. Description: Provide labor, material, excavation, backfill, to install additional underground soil, waste, and vent pipe, fittings, etc. for the following pipe sizes:
b. Comply with requirements for Division 22 Section 22 13 16 “Sanitary Waste and Vent Piping”
c. Unit of Measurement: Per Linear Foot.

1.	2”	$	LF	$	per fitting
2.	4”	$	LF	$	per fitting
3.	6”	$	LF	$	per fitting

4. Unit Price No. 22D – Underground Storm Drainage Piping as Noted.

   a. Description: Provide labor, material, excavation, backfill, to install additional underground storm drainage pipe, fittings, etc. for the following pipe sizes:
   b. Comply with requirements for Division 22 Section 22 14 13 “Facility Storm Drainage Piping”
   c. Unit of Measurement: Per Linear Foot.

1.	3”	$	LF	$	per fitting
2.	4”	$	LF	$	per fitting
3.	6”	$	LF	$	per fitting

C. HEATING, VENTILATING & AIR CONDITIONING to be provided by HVAC Construction Contractors only:

1. Unit Price No. 23A – Hydronic Pipe.

   a. Description: Provide and install additional hydronic pipe, insulation, hangers, fittings, etc., for the following pipe sizes:
   b. Comply with requirements for Division 23 Section 23 21 13 “Hydronic Piping”.
   c. Unit of Measurement: Per Linear Foot.

1.	¾”	$	LF	$	per fitting	$	per valve
2.	1”	$	LF	$	per fitting	$	per valve
3.	1 ¼”	$	LF	$	per fitting	$	per valve
4.	1 ½”	$	LF	$	per fitting	$	per valve
5.	2”	$	LF	$	per fitting	$	per valve

D. ELECTRICAL to be provided by Electrical Construction Contractors only:

1. Unit Price 26A – 20 amp Duplex Receptacles:

   a. Description: Provide and install additional duplex receptacle outlets each including outlet box, wall plate, 100’ of concealed wire (2-#12 and 1-#12 ground) in a ¾” EMT conduit and connection to spare branch circuit protective device in a panel board.
   b. Comply with requirements for Division 26 Section 26 27 26 “Wiring Devices”.
   c. Unit of Measurement: Each receptacle installed in normal course of construction.

2. Unit Price 26B –20 amp Rated Wire and Conduit:

   a. Description: Provide and install additional electrical connections each including 100 lineal feet of concealed (2 #12 and #12 ground) wire in ¾” EMT conduit, terminations at nearest panelboard and at an electrical device or electrical equipment. Include all testing and labeling. Conduit supports shall be as per Specifications. Make all connections necessary for complete and fully functional installation.
   b. Comply with requirements for Division 26 Section 26 05 19 “Low-Voltage Electrical Power Conductors & Cable” and 26 05 33 “Raceway Boxes for Electrical Systems”.
   c. Unit of Measurement: Each 100 Linear Feet.

3. Unit Price 26C – Exit Sign

   a. Description: Provide and install additional exit sign assemblies, appropriate mounting equipment, up to 200 lineal feet of concealed wire (2 #10 and 1 #10 ground) in ¾” EMT conduit and all terminations and connections. Connect to closest normal/emergency life safety circuit.
   b. Comply with requirements for Division 26 Sections and Drawing requirements for similar work.
   c. Unit of Measurement: Per assembly.

F. ELECTRONIC SAFETY AND SECURITY to be provided by Electrical Construction Contractors only:

1. Unit Price 28A –Fire Alarm Audible/Visual Device

    a. Description: Provide and install additional fire alarm A/V device assemblies, consisting of A/V device, backbox, up to 50 linear feet of ¾" EMT conduit, cabling and all terminations and connections to fire alarm system and programming required.
    b. Comply with requirements for Division 28 Sections and Drawing requirements for similar work.
    c. Unit of Measurement: Per assembly.

END OF SECTION 01 22 00

SECTION 01 23 00 – ALTERNATES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for alternates.

1.3 DEFINITIONS

A. Alternate: An amount proposed by bidders and stated on the Bid Form for certain work defined in the Bidding Requirements that may be added to or deducted from the base bid amount if Owner decides to accept a corresponding change either in the amount of construction to be completed or in the products, materials, equipment, systems, or installation methods described in the Contract Documents.

1. Alternates described in this Section are part of the Work only if enumerated in the Agreement.
2. The cost or credit for each alternate is the gross addition to or deduction from the Contract Sum to incorporate alternate into the Work. No other adjustments are made to the Contract Sum.

1.4 PROCEDURES

A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project.

1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.

B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates.

C. Execute accepted alternates under the same conditions as other work of the Contract.

D. Schedule: A schedule of alternates is included at the end of this Section. Specification Sections referenced in schedule contain requirements for materials necessary to achieve the work described under each alternate.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.1.1 SCHEDULE OF ALTERNATES

A. DIVISION 04 – MASONRY

1. Alternate Bid No. 04A – Masonry Repointing – Buildings in Entirety (to be bid by the GC)

a. Base Bid: Provide brick masonry repointing per the Bid Documents in the base bid price.

b. Add Alternate Bid: Provide the cost to add repointing of all existing brick masonry on the Away Building, Home Building, and Concession Stand Building.

B. DIVISION 26 – ELECTRICAL (to be bid by the EC)

1. Alternate Bid No. 26A – Softball Field Lighting

a. Base Bid: Provide electrical scope per the Bid Documents in the base bid price.
b. Deduct Alternate Bid: Provide the cost deduct to eliminate the added stadium lighting to the softball field per the Bid Documents Alternate information. Electrical scope per E drawings

END OF SECTION 01 23 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for substitutions.

1. Architect will consider requests for substitution if received within 7 days prior to receipt of Bids. Request received after that may be considered or rejected at discretion of Architect.
2. Only substitutions for cause or Owner convenience will be considered subsequent to contract award.

B. Related Sections:

1. Division 01 Section "Alternates" for products selected under an alternate.
2. Division 01 Section "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.
3. Divisions 02 through 33 Sections for specific requirements and limitations for substitutions.

1.3 DEFINITIONS

A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Owner through cost savings or reduced timeline.

1.4 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Substitution Request Form: Use form “PC/SR” provided in the Project Manual following this section.
2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:

a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.

c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
e. Samples, where applicable or requested.
f. Certificates and qualification data, where applicable or requested.
g. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
i. Research reports evidencing compliance with building code in effect for Project, from ICC-NC.
j. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
k. Cost information, including a proposal of change, if any, in the Contract Sum.
l. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
m. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

    a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    b. Substitution request is fully documented and properly submitted.
    c. Requested substitution will not adversely affect Contractor's construction schedule.
    d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    e. Requested substitution is compatible with other portions of the Work.
    f. Requested substitution has been coordinated with other portions of the Work.
    g. Requested substitution provides specified warranty.
    h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience to Owner: Will be considered if contractor submits savings of cost or reduction of timeline to the Architect and the following requirements are met.

    a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    b. Substitution request is fully documented and properly submitted.
    c. Requested substitution will not adversely affect Contractor's construction schedule.
    d. Requested substitution has received necessary approvals of authorities having jurisdiction.
    e. Requested substitution is compatible with other portions of the Work.
    f. Requested substitution has been coordinated with other portions of the Work.
    g. Requested substitution provides specified warranty.
    h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SUBSTITUTION REQUEST
(After Bidding)

PROJECT: **MCCASKEY HIGH SCHOOL STADIUM PROJECTS**

SUBSTITUTION REQUEST NUMBER: _____

TO: _____ FROM: _____

DATE: _____

_____ A/E PROJECT NUMBER: _____24-SDL-03_____

RE: _____ CONTRACT FOR: _____

SPECIFICATION TITLE: _____ DESCRIPTION: _____

SECTION: _____ PAGE: _____ ARTICLE/PARAGRAPH: _____

PROPOSED SUBSTITUTION: _____

MANUFACTURER: _____ ADDRESS: _____ PHONE: _____

TRADE NAME: _____ MODEL NO.: _____

INSTALLER: _____ ADDRESS: _____ PHONE: _____

HISTORY: ☐ New product ☐ 1-4 years old ☐ 5-10 years old ☐ More than 10 years old

Differences between proposed substitution and specified product:

The Requested Substitution varies from the requirements of the plans, specifications and contract documents only in the following respects:

☐ Point-by-point comparative data attached – REQUIRED BY A/E

Reason for not providing specified item:

Similar Installation:

Project: Architect:

Address: Owner:

Date Installed:

Proposed substitution affects other parts of Work: ☐ No ☐ Yes; explain

Savings to Owner for accepting substitution: _____ ($_____).

Proposed substitution changes Contract Time: ☐ No ☐ Yes [Add] [Deduct] _____ days.

Supporting Data Attached: ☐ Drawings ☐ Product Data ☐ Samples ☐ Tests ☐ Reports ☐ _____

Contractor and Subcontractor request that Owner and Architect authorize the Requested Substitution described above. Contractor and Subcontractor, jointly and severally, make the following promises and representations about the Requested Substitution.

- Proposed substitution has been fully investigated and determined to be equal or superior in all respects to specified product.
- Same warranty will be furnished for proposed substitution as for specified product.
- Same maintenance service and source of replacement parts, as applicable, is available.
- Proposed substitution will have no adverse effect on other trades and will not affect or delay progress schedule.
- Cost data as stated above is complete. Claims for additional costs related to accepted substitution which may subsequently become apparent are to be waived.
- Proposed substitution does not affect dimensions and functional clearances.
- Payment will be made for changes to building design, including A/E design, detailing, and construction costs caused by the substitution.
- Coordination, installation, and changes in the Work as necessary for accepted substitution will be complete in all respects.
- Errors, omissions or oversights by Owner or Architect in review of this request shall not be the basis for any claim or defense by the Contractor or Subcontractor.
- The Requested Substitution complies in all respects with all applicable building laws, codes and regulations.
- Contractor and Subcontractor have carefully evaluated the Authorized Substitution and have determined that it complies in all respects with all requirements of the plans, specifications and contract documents for the Project except as specifically noted herein or in any attached exhibit.
- Contractor and Subcontractor clearly understand that any authorizations to make the Requested Substitution will be based entirely on the promises and representations of Contractor and Subcontractor and will not permit, authorize or approve any deviation from the plans, specifications or contract documents except as specifically set forth herein or in any exhibit.
- Contractor and Subcontractor are completely and solely responsible for compliance of the Requested Substitution with all requirements of the plans, specifications and contract documents except as specifically set forth herein or in any attached exhibit.
- Contractor and Subcontractor expressly warrant that the Requested Substitution is merchantable and suitable for its intended purpose.

Submitted by: _____

Signed by: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments: _____

_____

_____

_____

A/E'S REVIEW AND ACTION

☐ Substitution approved – Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.

☐ Substitution approved as noted – Make submittals in accordance with Specification Section 01 25 00 Substitution Procedures.

☐ Substitution rejected – Use specified materials.

☐ Substitution Request received too late – Use specified materials.

Signed by: _____ Date: _____
Owner

Signed by: _____ Date: _____
Architect

Additional Comments: ☐ Contractor ☐ Subcontractor ☐ Supplier ☐ Manufacturer ☐ A/E ☐ _____

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for handling and processing Contract modifications.

B. Related Sections:

1. Division 01 Section "Product Requirements" for administrative procedures for handling requests for substitutions made after Contract award.

1.3 MINOR CHANGES IN THE WORK

A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710, "Architect's Supplemental Instructions."

1.4 PROPOSAL REQUESTS

A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.

1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
2. Within time specified in Proposal Request or 5 days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

    a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
    b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
    c. Include costs of labor and supervision directly attributable to the change.
    d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
    e. Quotation Form: Use "Proposal Worksheet Summary" and "Proposal Worksheet Detail". Sample copies are included in the Project Manual.

B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.

1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
3. Indicate applicable taxes, bond, delivery charges, equipment rental, and amounts of trade discounts.
4. Include costs of labor and supervision directly attributable to the change.
5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
6. Comply with requirements in Division 01 Section "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use "Change Order Request (Proposal)" with "Proposal Worksheet Summary" and "Proposal Worksheet Detail". Sample copy is included in Project Manual.

1.5 ADMINISTRATIVE CHANGE ORDERS

A. Unit Price Adjustment: Refer to Division 01 Section "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit price work.

1.6 CHANGE ORDER PROCEDURES

A. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.7 CONSTRUCTION CHANGE DIRECTIVE

A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.

B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.

1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section specifies administrative and procedural requirements necessary to prepare and process Applications for Payment.

B. Related Sections:

1. Division 01 Section "Unit Prices" for administrative requirements governing the use of unit prices.
2. Division 01 Section "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
3. Division 01 Section "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.
4. Division 01 Section "Submittal Procedures" for administrative requirements governing the preparation and submittal of the submittal schedule.

1.3 DEFINITIONS

A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.

1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:

    a. Application for Payment forms with continuation sheets.
    b. Submittal schedule.
    c. Items required to be indicated as separate activities in Contractor's construction schedule.

2. Submit the schedule of values to Architect within 21 days of NTP but no later than seven days before the date scheduled for submittal of initial Applications for Payment.
3. Sub-schedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work; provide sub-schedules showing values correlated with each element.

B. Format and Content: Use the Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item broken down by Labor, Materials and Equipment for each Specification Section.

1. Identification: Include the following Project identification on the schedule of values:

    a. Project name and location.
    b. Name of Architect.

c. Architect's project number.
d. Contractor's name and address.
e. Date of submittal.

2. Arrange schedule of values consistent with format of AIA Document G703.
3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:

a. Related Specification Section or Division.
b. Description of the Work.
c. Name of subcontractor.
d. Name of manufacturer or fabricator.
e. Name of supplier.
f. Change Orders (numbers) that affect value.
g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.

1) Labor.
2) Materials.
3) Equipment.

4. Provide at a minimum, separate line items for each material within each building system and as defined within the specifications.

5. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of Contract Sum.

a. Site Construction: Division 31 through 33.
b. Building Construction: Divisions 01 through 30.
c. Include separate line items under principal subcontracts for project closeout requirements to include:

1) Operation & Maintenance Manuals
2) Punch List Activities
3) Record Documents
4) Demonstration & Training

in an amount totaling a minimum of five percent of the Contract Sum and subcontract amount.

6. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
7. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.

a. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance.

8. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
9. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place shall be shown as separate line items in the schedule of values.

10. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.

1.5 APPLICATIONS FOR PAYMENT

A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.

1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.

B. Payment Application Times: Progress payments shall be submitted to Architect by the 25th day of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.

1. Submit draft copy of Application for Payment seven days prior to due date for review by Architect.

C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, acknowledgement of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:

    a. Materials previously stored and included in previous Applications for Payment.
    b. Work completed for this Application utilizing previously stored materials.
    c. Additional materials stored with this Application.
    d. Total materials remaining stored, including materials with this Application.

F. Transmittal: Submit four signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt. One copy shall include waivers of lien and similar attachments if required.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Partial Release: With each Application for Payment, submit executed Owner’s form of Partial Release for the construction period covered by the application.

1. Submit partial release on each item for amount requested in previous application, before deduction for retainage, on each item.
2. Owner reserves the right to designate which entities involved in the Work must submit release.

H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors: Submit within 7 days of Notice to Proceed.

2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).
4. Products list (preliminary if not final).
5. Schedule of unit prices.
6. Submittal schedule (preliminary if not final).
7. List of Contractor's staff assignments.
8. List of Contractor's principal sub-contractors.
9. Copies of building permits.
10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
11. Initial progress report.
12. Report of preconstruction conference.
13. Certificates of insurance and insurance policies.
14. Performance and payment bonds.
15. Data needed to acquire Owner's insurance.
16. Initial settlement survey and damage report if required.

I. Application for Payment at Substantial Completion: After issuing the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.

1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

J. Final Payment Application: Submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:

1. Evidence of completion of Project closeout requirements.
2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
3. Updated final statement, accounting for final changes to the Contract Sum.
4. AIA Document G706, "Contractor's Affidavit of Payment of Debts and Claims."
5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
6. AIA Document G707, "Consent of Surety to Final Payment."
7. Evidence that claims have been settled.
8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
9. Final liquidated damages settlement statement.

K. Owner Approval: The Owner must approve all payment applications prior to payment.

L. Retainage Reduction Affirmation: When requesting a reduction in retainage, Contractor must sign and submit a Retainage Reduction Affirmation form.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

CERTIFICATION AND PARTIAL RELEASE

Contractor: _____

Project: McCaskey High School Stadium Projects Application for Payment

for Period Ending: _____

The Contractor certifies that, upon receipt of the amount certified by the Design Professional as due in connection with the application for a progress payment submitted with this Certification and Partial Release, the Contractor has received payment in full for or on account of all amounts due under the Contract for Construction with the School District of Lancaster (the “Owner") for the Project referenced above through the end of the period covered by the application for payment, including any amounts due for extra or additional work, change orders, damages, delays, claims of any kind, or any other increase to the Contract Sum. In consideration of prior payments received and receipt of this payment, the Contractor hereby waives, releases and forever discharges the Owner from any and all obligations and liabilities arising under or on account of the Contract for Construction and the Project, or either of them, through the end of the period covered by the application for payment, including any obligations or liabilities for extra or additional work, change orders, damages, delays, interest, penalties for late payment, attorney's fees, claims of any kind, or any other increase to the Contract Sum, and hereby expressly waives and relinquishes the right to have, file or maintain any mechanic's liens or claims against the Project, the building(s), the improvement, the land covered thereby and the lot or cartilage appurtenant thereto ("the Premises").

The Contractor certifies that all charges for labor, materials, services and every other nature in connection with the Contract for Construction for Work performed through the period covered by previous applications for payment have been paid in full, and that there remains no amount due, or claimed to be due, to any subcontractor, vendor, or individual furnishing Iabor or material in connection with such Work, with the exception of the following:

The Contractor hereby further declares and agrees that in the event that any lien or other claim should be brought against Owner, or the Project or Premises, the Contractor will protect the Owner and defend any suit or action brought against the Owner by reason of any lien or other form of claim or action arising out of the Contract for Construction and hold the Owner harmless and indemnified therefrom.

Signed and sealed by the Contractor this_____day of _____, 20___.

CONTRACTOR

By: _____

Title: _____ (CORPORATE SEAL)

ACKNOWLEDGMENT AND AFFIDAVIT

COMMONWEALTH OF PENNSYLVANIA

COUNTY OF _____

Be it remembered, that on this day of . 20___ , before me appeared _____ , being duly sworn according to law, did depose and say that he/she is the _____ of the Contractor described in and which executed the foregoing Certification and Partial Release; he/she signed, sealed and delivered same as authorized as the voluntary act and deed of Contractor for the uses and purposes therein expressed; and that the facts set forth therein are correct to the best of his/her knowledge, information and belief.

Sworn and Subscribed
before me this _____ day
of _____, 20_____ .

Notary Public

My commission expires:

SCHOOL DISTRICT of LANCASTER
McCaskey High School Stadium
Projects

RETAINAGE REDUCTION AFFIRMATION

_____ **(Contractor)** has requested a reduction in contract retainage to ___% for the above referenced project.

Since the **School District of Lancaster (SDoL)** is now substantially occupying the Project premises, **SDoL** is willing to authorize the release of this retainage amount subject to Contractor's affirmation of the following:

1. Contractor agrees to complete its contract Work (including all punch list items) and satisfy any outstanding contractual obligations prior to its submission for Final Payment.

2. Contractor certifies that it has paid or otherwise satisfied all payrolls, bills for materials and equipment and other indebtedness in connection with the Work of the Contract for which Contractor has already received payment from SDoL.

3. Contractor asserts that its Application for Payment #___ represents all known claims at this time with the exception of: [Identify specifically or write "None"]

   _____

   _____

   _____.

WITNESS OR ATTESTED TO BY:

_____

RELEASOR: **Contractor**

By: _____

Title: _____

COMMONWEALTH OF PENNSYLVANIA)
) SS.
COUNTY OF)

I certify that on _____, 202__, _____ personally came before me and acknowledged under oath, to my satisfaction, that he/she is the person named in and personally signed this document herein and signed, sealed and delivered this document as his/her act and deed, as authorized on behalf of Releasor.

_____
Notary Public

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:

1. General coordination procedures.
2. Coordination drawings.
3. Requests for Information (RFIs).
4. Project meetings.

B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.

C. Related Requirements:

1. Section 01 12 00 "Multiple Contract Summary" for a description of the division of work among separate contracts and responsibility for coordination activities not in this Section.
2. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
3. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
4. Section 01 77 00 "Closeout Procedures" for coordinating closeout of the Contract.
5. Section 01 91 13 "General Commissioning Requirements" for coordinating the Work with Owner's Commissioning Authority.

1.3 DEFINITIONS

A. RFI: Request from Owner, Construction Manager, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

A. Subcontract List: Within (14) calendar days of NTP, prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.

B. Key Personnel Names: Within 5 days of notice to proceed, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including home, office, and cellular

telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.

1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.

C. In addition to Project superintendent, provide other administrative and supervisory personnel as required for proper performance of the Work.

1. Include special personnel required for coordination of operations with other contractors.

1.5 GENERAL COORDINATION PROCEDURES

A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.

B. Coordination: Each contractor shall coordinate its construction operations with those of other contractors and entities to ensure efficient and orderly installation of each part of the Work. Each contractor shall coordinate its operations with operations, included in different Sections that depend on each other for proper installation, connection, and operation.

1. Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
2. Coordinate installation of different components with other contractors to ensure maximum performance and accessibility for required maintenance, service, and repair.
3. Make adequate provisions to accommodate items scheduled for later installation.
4. Where availability of space is limited, coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.

C. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.

1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.

D. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:

1. Preparation of Contractor's construction schedule.
2. Preparation of the schedule of values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Pre-installation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.

E. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.6 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.
h. Refer to Divisions 21 through 26 specification sections for specific Coordination Drawing requirements for mechanical and electrical installations.

2. Sheet Size: At lease 8-1/2 by 11 inches but no larger than 30 by 40 inches.
3. Number of Copies: Submit four opaque copies of each submittal. Architect will return one copy.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate sub-framing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
c. Fire-rated enclosures around ductwork.

7. Electrical Work: Show the following:

a. Runs of vertical and horizontal conduit 1-1/4 inches (32 mm) in diameter and larger.
b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
d. Location of pull boxes and junction boxes dimensioned from column center lines.

8. Review: Architect will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make changes as directed and resubmit.
9. Coordination Drawing Prints: Prepare coordination drawing prints according to requirements in Section 013300 "Submittal Procedures."

C. Coordination Digital Data Files: Prepare coordination digital data files according to the following requirements:

1. File Preparation Format: Same digital data software program, version, and operating system as original Drawings.
2. File Preparation Format: DWG, Version 2010, operating in Microsoft Windows operating system.
3. File Submittal Format: Submit or post coordination drawing files using Portable Data File (PDF) format.
4. Architect will furnish Contractor one set of digital data files of background document Drawings for use in preparing coordination digital data files.

a. Architect makes no representations as to the accuracy or completeness of digital data files as they relate to Drawings.
b. Digital Data Software Program: Drawings are available in AutoCAD 2010 operating in Microsoft Windows.
c. Contractor shall execute a data licensing agreement in the form of AIA Document C106.

1.7 REQUESTS FOR INFORMATION (RFIs)

A. General: Immediately on discovery of the need for additional information or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Architect and Construction Manager.
6. RFI number, numbered sequentially.

7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor Representative Name.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

    a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. RFI Forms: Form bound in Project Manual or Software-generated form with substantially the same content as indicated above, acceptable to Architect.

1. Attachments shall be electronic files in PDF format.

D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow seven working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

    a. Requests for approval of submittals.
    b. Requests for approval of substitutions.
    c. Requests for approval of Contractor's means and methods.
    d. Requests for coordination information already indicated in the Contract Documents.
    e. Requests for adjustments in the Contract Time or the Contract Sum.
    f. Requests for interpretation of Architect's actions on submittals.
    g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt of additional information.
3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Section 012600 "Contract Modification Procedures."

    a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect, Construction Manager, and Project Manager in writing within (5) five days of receipt of the RFI response.

E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log bi-weekly. Include the following:

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect, Construction Manager and Project Manager.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.

F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect and Project Manager within five (5) days if Contractor disagrees with response.

1. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.

2. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

1.8 PROJECT MEETINGS

A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Coordinate with Owner, Construction Manager, Project Manager and Architect proposed meeting dates and times.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: General Contractor shall record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, Construction Manager, Project Manager, and Architect, within (3) three days of the meeting.

B. Preconstruction Conference: Architect will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner, Project Manager and Architect, but no later than (15) fifteen days after Notice to Proceed.

1. Purpose of the conference is to review responsibilities and personnel assignments.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Construction Manager, Project Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect progress, including the following:

    a. Tentative construction schedule.
    b. Review of Milestone Schedule Requirements.
    c. Critical work sequencing and long-lead items.
    d. Designation of key personnel and their duties.
    e. Lines of communications.
    f. Procedures for processing field decisions and Change Orders.
    g. Procedures for RFIs.
    h. Procedures for testing and inspecting.
    i. Procedures for processing Applications for Payment.
    j. Distribution of the Contract Documents.
    k. Submittal procedures.
    l. Preparation of record documents.
    m. Use of the premises and adjacent properties.
    n. Work restrictions.
    o. Working hours.
    p. Responsibility for temporary facilities and controls.
    q. Procedures for moisture and mold control.
    r. Procedures for disruptions and shutdowns.
    s. Construction waste management and recycling.
    t. Parking availability.
    u. Office, work, and storage areas.
    v. Equipment deliveries and priorities.
    w. First aid.
    x. Security.
    y. Progress cleaning.

C. Pre-installation Conferences: Prime Contractors shall conduct a pre-installation conference at Project site before each construction activity that requires coordination with other construction.

1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect, Construction Manager, Project Manager, and Owner's Commissioning Authority of scheduled meeting dates.

2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:

    a. Contract Documents.
    b. Options.
    c. Related RFIs.
    d. Related Change Orders.
    e. Purchases.
    f. Deliveries.
    g. Submittals.
    h. Review of mockups.
    i. Possible conflicts.
    j. Compatibility requirements.
    k. Time schedules.
    l. Weather limitations.
    m. Manufacturer's written instructions.
    n. Warranty requirements.
    o. Compatibility of materials.
    p. Acceptability of substrates.
    q. Temporary facilities and controls.
    r. Space and access limitations.
    s. Regulations of authorities having jurisdiction.
    t. Testing and inspecting requirements.
    u. Installation procedures.
    v. Coordination with other work.
    w. Required performance results.
    x. Protection of adjacent work.
    y. Protection of construction and personnel.

3. Responsible Contractor shall record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
4. Responsible Contractor shall report and distribute minutes of the meeting to each party present and to other parties requiring information.
5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.

D. Progress Meetings: The Architect will conduct progress meetings at bi-weekly intervals.

1. Coordinate dates of meetings with preparation of payment requests.
2. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Project Manager, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

    a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.

        1) Review schedule for next period.

    b. Review present and future needs of each entity present, including the following:

        1) Interface requirements.

2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.
11) Progress cleaning.
12) Quality and work standards.
13) Status of correction of deficient items.
14) Field observations.
15) RFIs.
16) Status of proposal requests.
17) Pending changes.
18) Status of Change Orders.
19) Pending claims and disputes.
20) Documentation of information for payment requests.

4. Minutes: The Owner's Project Manager will record and distribute the meeting minutes to each party present and to parties requiring information.

a. Schedule Updating: The General Contractor shall revise Contractor's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with each meeting.

E. Coordination Meetings: The General Contractor shall conduct Project coordination meetings at weekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes, such as progress meetings and pre-installation conferences.

1. Attendees: In addition to representatives of Owner, Owner's Commissioning Authority, Owner's Project Manager, Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work.
2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.

a. Combined Contractor's Construction Schedule: Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
b. Schedule Updating: Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting.
c. Review present and future needs of each contractor present, including the following:

1) Interface requirements.
2) Sequence of operations.
3) Status of submittals.
4) Deliveries.
5) Off-site fabrication.
6) Access.
7) Site utilization.
8) Temporary facilities and controls.
9) Work hours.
10) Hazards and risks.

11) Progress cleaning.
12) Quality and work standards.
13) Change Orders.

3. Reporting: General Contractor shall record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

F. Project Closeout Conference: The Architect will schedule and conduct a project closeout conference, at a time convenient to Owner, Owner's Project Manager, and Architect, but no later than (90) ninety days prior to the scheduled date of Final Completion.

1. Conduct the conference to review requirements and responsibilities related to Project closeout.
2. Attendees: Authorized representatives of Owner, Owner's Commissioning Authority, Owner's Project Manager, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a. Preparation of record documents.
b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
c. Submittal of written warranties.
d. Requirements for preparing operations and maintenance data.
e. Requirements for delivery of material samples, attic stock, and spare parts.
f. Requirements for demonstration and training.
g. Preparation of Contractor's punch list.
h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
i. Submittal procedures.
j. Coordination of separate contracts.
k. Owner's partial occupancy requirements.
l. Installation of Owner's furniture, fixtures, and equipment.
m. Responsibility for removing temporary facilities and controls.

4. Minutes: The Owner's Project Manager shall record and distribute meeting minutes.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

MAROTTA/MAIN
ARCHITECTS

RFI – REQUEST FOR INFORMATION

PROJECT NAME: McCaskey High School Stadium Projects

DATE:

E-MAIL:

MAROTTA / MAIN ARCHITECTS NO.: 24-SDL-03

PHONE:

FAX:

Specification Section: _____Paragraph: _____ Drawing Reference: _____ Detail: _____

REQUEST FOR INFORMATION:

RESPONSE:

Response From: _____ Date Returned:_____

214 N. Duke Street, Lancaster, PA 17602 P 717.393.3211 F 717.393.3212

www.marottamain.com

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:

1. Startup construction schedule.
2. Contractor's construction schedule.
3. Construction schedule updating reports.
4. Daily construction reports.
5. Material location reports.
6. Site condition reports.
7. Special reports.

B. Related Requirements:

1. Section 01 12 00 "Multiple Contract Summary" for preparing a combined Contractor's construction schedule.
2. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
3. Section 01 40 00 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.

1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
2. Predecessor Activity: An activity that precedes another activity in the network.
3. Successor Activity: An activity that follows another activity in the network.

B. Cost Loading: The allocation of the schedule of values for the completion of an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum unless otherwise approved by Architect.

C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.

E. Event: The starting or ending point of an activity.

F. Float: The measure of leeway in starting and completing an activity.

1. Float time belongs to Owner.
2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

G. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.

H. Major Area: A story of construction, a separate building, or a similar significant construction element.

I. Milestone: A key or critical point in time for reference or measurement.

J. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.

K. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

A. Submittals Schedule: Submit three copies of schedule. Arrange the following information in a tabular format:

1. Scheduled date for first submittal.
2. Specification Section number and title.
3. Submittal category (action or informational).
4. Name of subcontractor.
5. Description of the Work covered.
6. Scheduled date for Architect's final release or approval.

B. Format for Submittals: Submit required submittals in the following formats:

1. PDF electronic file.

C. Startup construction schedule.

1. Approval of cost-loaded, startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.

D. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.

E. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.

1. Submit a working electronic copy of schedule, using software indicated, and labeled to comply with requirements for submittals. Include type of schedule (initial or updated) and date on label.

F. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.

1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
3. Total Float Report: List of all activities sorted in ascending order of total float.

G. Construction Schedule Updating Reports: Submit with Applications for Payment.

H. Daily Construction Reports: Submit at weekly intervals to Architect and Owner's Rep.

I. Material Location Reports: Submit at bi-weekly intervals.

J. Site Condition Reports: Submit at time of discovery of differing conditions.

K. Special Reports: Submit at time of unusual event.

L. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.

B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 01 31 00 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's construction schedule, including, but not limited to, the following:

1. Review software limitations and content and format for reports.
2. Verify availability of qualified personnel needed to develop and update schedule.
3. Discuss constraints, including work stages and interim milestones.
4. Review delivery dates for Owner-furnished products.
5. Review schedule for work of Owner's separate contracts.
6. Review submittal requirements and procedures.
7. Review time required for review of submittals and resubmittals.
8. Review requirements for tests and inspections by independent testing and inspecting agencies.
9. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
10. Review and finalize list of construction activities to be included in schedule.
11. Review procedures for updating schedule.

1.6 COORDINATION

A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate contractors. The Project Coordinator / General Contractor is responsible to prepare and maintain the project schedule. All other Prime contractors shall cooperate with the Project Coordinator by providing information requested within one business day regarding their activities or activities of their sub-contractors

B. Coordinate Contractor's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.

1. Secure time commitments for performing critical elements of the Work from entities involved.
2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

PART 2 - PRODUCTS

2.1 SUBMITTALS SCHEDULE

A. Preparation: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, resubmittal, ordering, manufacturing, fabrication, and delivery when establishing dates.

1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Values, and Contractor's Construction Schedule.
2. Initial Submittal: Submit concurrently with preliminary network diagram. Include all submittals. Submit all submittals within 21 days of receiving Notice to Proceed. List those required to maintain orderly progress of the Work.

    a. At Contractor's option, show submittals on the Preliminary Construction Schedule, instead of tabulating them separately.

3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's Construction Schedule.

2.2 CONTRACTOR'S CONSTRUCTION SCHEDULE, GENERAL

A. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.

1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.

B. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Comply with the following:

1. Activity Duration: Define activities so no activity is longer than (10) ten days, unless specifically allowed by Architect.
2. Procurement Activities: Include procurement process activities for the following long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.

    a. Site Inlets
    b. Masonry
    c. Structural Steel
    d. Custom Cabinetry
    e. Exterior Entrance Systems
    f. Windows
    g. Doors, Frames and Door Hardware
    h. Kitchen Equipment
    i. Pre-manufactured Casework
    j. Elevators
    k. Plumbing Equipment
    l. Plumbing Fixtures
    m. Building Management System
    n. Coordination Drawings
    o. Lighting Fixtures
    p. Electrical Switchgear
    q. Electrical Panels
    r. Emergency Generator
    s. HVAC Equipment
    t. Building Transformer

u. Chillers
v. Air Handling Equipment
w. Blower/Fan Coil Units
x. Boilers

3. Submittal Review Time: Include review and resubmittal times indicated in Section 01 33 00 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's construction schedule with submittal schedule.
4. Startup and Testing Time: Include no fewer than (15) fifteen days for startup and testing.
5. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow no fewer that (10) ten days for Architect's, Owner's Representative administrative procedures necessary for certification of Substantial Completion.
6. Punch List and Final Completion: Include not more than (30) thirty days for completion of punch list items and final completion.
7. Code inspections: Include no fewer than (5) five calendar days for code inspections.

C. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.

1. Phasing: Arrange list of activities on schedule by phase.
2. Work under More Than One Contract: Include a separate activity for each contract.
3. Work by Owner: Include a separate activity for each portion of the Work performed by Owner.
4. Products Ordered in Advance: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
5. Owner-Furnished Products: Include a separate activity for each product. Include delivery date indicated in Section 01 10 00 "Summary." Delivery dates indicated stipulate the earliest possible delivery date.
6. Work Restrictions: Show the effect of the following items on the schedule:

a. Limitations of adjacent occupancies.
b. Uninterruptible services.
c. Occupancy of the new school before demolition of existing.
d. Use of premises restrictions.
e. Seasonal variations.
f. Environmental control.

7. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:

a. Utility connections.
b. Subcontract awards.
c. Submittals.
d. Purchases.
e. Mockups.
f. Fabrication.
g. Sample testing.
h. Deliveries.
i. Installation.
j. Tests and inspections.
k. Adjusting.
l. Curing.
m. Building flush-out.
n. Startup and placement into final use and operation.

8. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:

a. Installation of erosion and sedimentation facilities.

b. Preparation of building pad.
c. Structural completion.
d. Temporary enclosure and space conditioning.
e. Permanent space enclosure.
f. Completion of mechanical installation.
g. Completion of electrical installation.
h. Milestones as identified in specification section 00 31 13.

9. Other Constraints: Inspectors of local and state agencies and authorities.

D. Milestones: Include milestones indicated in the Contract Documents in Section 00 31 13 “Preliminary Schedule” in addition to the Notice to Proceed, Substantial Completion, and final completion.

E. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:

1. Unresolved issues.
2. Unanswered Requests for Information.
3. Rejected or unreturned submittals.
4. Notations on returned submittals.
5. Pending modifications affecting the Work and Contract Time.

F. Recovery Schedule: When periodic update indicates the Work is (14) fourteen or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.

G. Each Prime Contractor is responsible to develop a schedule of his own activities to comply with provision of article 2.2 of this Section or a format acceptable to Project Coordinator. Additionally, each Prime Contractor shall coordinate their activities with all other prime contractors. Project Coordinator shall consolidate each Prime Contractor’s schedule into a Consolidated Schedule. Each Prime Contractor shall submit updated schedules with the monthly application for payment, with copies provided to all other prime contractors. Any Contractor not submitting their information will not have their Application for Payment processed until the required information is submitted. The Project Coordinator shall consolidate and issue an updated schedule regardless of whether or not all Prime Contractors have submitted updated schedules, not later than the 10th of the following month.

1. The consolidation of the schedule of all Prime Contractors is the responsibility of the Project Coordinator. When Prime Contractors do not provide their schedule when and in the format required, the Owner may in its sole discretion engage an outside scheduling consultant. Any and all resulting costs for this consultant shall be deducted from the respective Prime Contractor.

H. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

1. Use Primavera, for Windows operating system, or pre-approved software.

2.3 STARTUP CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Submit startup, horizontal, bar-chart-type construction schedule within (10) ten days of date established for the Notice to Proceed.

B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first (90) ninety days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

C. General: Prepare network diagrams using AON (activity-on-node) format.

D. Startup Network Diagram: Submit diagram within 14 days of date established for commencement of the Work. Outline significant construction activities for the first 90 days of construction. Include skeleton diagram for the remainder of the Work.

2.4 CONTRACTOR'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

A. CPM Schedule: Prepare Contractor's construction schedule using a time-scaled CPM network analysis diagram for the Work.

1. Develop network diagram in sufficient time to submit CPM schedule so it can be accepted for use as required in the AIA 201, General Conditions.

    a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates, regardless of Architect's approval of the schedule.

2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.

B. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using startup network diagram, prepare a skeleton network to identify probable critical paths.

1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:

    a. Preparation and processing of submittals.
    b. Mobilization and demobilization.
    c. Purchase of materials.
    d. Delivery.
    e. Fabrication.
    f. Utility interruptions.
    g. Installation.
    h. Work by Owner that may affect or be affected by Contractor's activities.
    i. Testing and commissioning.
    j. Punch list and final completion.
    k. Activities occurring following final completion.

2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.

    a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.

C. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall project schedule.

D. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:

1. Contractor or subcontractor and the Work or activity.
2. Description of activity.
3. Main events of activity.
4. Immediate preceding and succeeding activities.
5. Early and late start dates.
6. Early and late finish dates.
7. Activity duration in workdays.
8. Total float or slack time.
9. Average size of workforce.
10. Dollar value of activity (coordinated with the schedule of values).

E. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:

1. Identification of activities that have changed.
2. Changes in early and late start dates.
3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.
8. Percentage completion of each activity.

2.5 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Accidents.
8. Meetings and significant decisions.
9. Unusual events (see special reports).
10. Stoppages, delays, shortages, and losses.
11. Meter readings and similar recordings.
12. Emergency procedures.
13. Orders and requests of authorities having jurisdiction.
14. Change Orders received and implemented.
15. Construction Directives received and implemented.
16. Services connected and disconnected.
17. Equipment or system tests and startups.
18. Partial completions and occupancies.
19. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
2. Material stored prior to previous report and since removed from storage and installed.
3. Material stored following previous report and remaining in storage.

C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a

detailed description of the differing conditions, together with recommendations for changing the Contract Documents.

2.6 SPECIAL REPORTS

A. General: Submit special reports directly to Owner within one (1) day of an occurrence. Distribute copies of report to parties affected by the occurrence.

B. Reporting Unusual Events: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.

PART 3 - EXECUTION

3.1 CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting using CPM scheduling.

1. In-House Option: Owner may waive the requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.

B. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before regularly scheduled progress meeting.

1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
3. As the Work progresses, indicate final completion percentage for each activity.

C. Distribution: Distribute copies of approved schedule to Architect, Owner, Owner’s Commissioning Authority separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.

1. Post copies in Project meeting rooms and temporary field offices.
2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

END OF SECTION 01 32 00

SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.

B. Related Sections:

1. Division 01 Section "Payment Procedures" for submitting Applications for Payment and the schedule of values.
2. Division 01 Section "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
3. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
4. Division 01 Section "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
5. Division 01 Section "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
6. Division 01 Section "Project Management and Coordination" for submitting and distributing meeting and conference minutes and for submitting Coordination Drawings.
7. Division 01 Section "Quality Requirements" for submitting test and inspection reports and for mockup requirements.
8. Division 01 Section “Product Requirements” for product delivery, storage, handling and submission of warranties.
9. Division 01 Section "Closeout Procedures" for submitting warranties.
10. Division 01 Section "Operation and Maintenance Data" for submitting operation and maintenance manuals.
11. Divisions 02 through 33 Sections for specific requirements for submittals in those Sections.

1.3 DEFINITIONS

A. Action Submittals: Written and graphic information and physical samples that require Architect's responsive action. Action submittals are those submittals indicated in individual Specification Sections as action submittals.

B. Informational Submittals: Written and graphic information and physical samples that do not require Architect's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as informational submittals.

C. Portable Document Format (PDF): An open standard file format licensed by Adobe Systems used for representing documents in a device-independent and display resolution-independent fixed-layout document format.

1.4 ACTION SUBMITTALS

A. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or modifications to submittals noted by the Architect and additional time for handling and reviewing submittals required by those corrections.

1. Coordinate submittal schedule with list of subcontracts, the schedule of values, and Contractor's construction schedule.
2. Initial Submittal: Submit concurrently with start-up construction schedule. Include submittals required during the first 60 days of construction. List those submittals required to maintain orderly progress of the Work and those required early because of long lead time for manufacture or fabrication.
3. Final Submittal: Submit concurrently with the first complete submittal of Contractor's construction schedule.

    a. Submit revised submittal schedule to reflect changes in current status and timing for submittals.

4. Format: Arrange the following information in a tabular format:

    a. Scheduled date for first submittal.
    b. Specification Section number and title.
    c. Submittal category: Action, informational.
    d. Name of subcontractor.
    e. Description of the Work covered.
    f. Scheduled date for Architect's final release or approval.
    g. Scheduled dates for purchasing.
    h. Scheduled dates for installation.
    i. Activity or event number.

1.5 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

A. Architect's Digital Data Files: At Contractor’s written request, electronic copies of the Revit file of the Contract Drawings will be provided by Architect for Contractor's use in preparing backgrounds only.

1. Contractor shall be responsible to confirm dimensions as measured in the field or as provided by the Manufacturer.

B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.

1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
2. Submit all submittal items required for each Specification Section concurrently unless partial submittals for portions of the Work are indicated on approved submittal schedule.
3. Submit action submittals and informational submittals required by the same Specification Section as separate packages under separate transmittals.
4. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.

    a. Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.

C. Processing Time: Allow time for submittal review, including time for resubmittals, as follows. Time for review shall commence on Architect's receipt of submittal. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing, including re-submittals.

1. Initial Review: Allow ten (10) ten business days for initial review of each submittal. Allow additional time if coordination with subsequent submittals is required. Architect will advise Contractor when a submittal being processed must be delayed for coordination.
2. Intermediate Review: If intermediate submittal is necessary, process it in same manner as initial submittal.
3. Resubmittal Review: Allow ten (10) ten business days for review of each re-submittal.
4. Sequential Review: Where sequential review of submittals by Architect's consultants, Owner, or other parties is indicated, allow fifteen (15) business days for initial review of each submittal.

    a. Site
    b. Structural
    c. Hardware
    d. Plumbing
    e. HVAC
    f. Electrical
    g. Acoustical
    h. IBAS

5. Concurrent Consultant Review: Where the Contract Documents indicate that submittals may be transmitted simultaneously to Architect and to Architect's consultants, allow fifteen (15) fifteen business days for review of each submittal. Submittal will be returned to Architect before being returned to Contractor.
6. Submit samples, chips, charts for materials and products for which color, pattern, and texture of other characteristics are required to be selected, including items where color is specified. All color submittals will be required before any color selections will be approved, in order to ensure color integrity for the entire project. Approval for color selections may take up to 30 days after all samples are received.
7. No extension of the Contract Time will be authorized because of failure to transmit submittals enough in advance of the Work to permit processing.
8. All submittals shall be shall be submitted no later than 120 calendar days after NTP.

D. Identification and Information: Place a permanent label or title block on each paper copy submittal item for identification.

1. Indicate name of firm or entity that prepared each submittal on label or title block.
2. Provide a space approximately 6 by 8 inches (150 by 200 mm) on label or beside title block to record Contractor's review and approval markings and action taken by Architect.
3. Include the following information for processing and recording action taken:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Name of subcontractor.
    f. Name of supplier.
    g. Name of manufacturer.
    h. Submittal number or other unique identifier, including revision identifier.

        1) Submittal number shall use Specification Section number followed by a decimal point and then a sequential number (e.g., 061000.01). Re-submittals shall include an alphabetic suffix after another decimal point (e.g., 061000.01.A).

    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.
    k. Location(s) where product is to be installed, as appropriate.
    l. Other necessary identification.

E. Options: Identify options requiring selection by the Architect.

F. Deviations: Identify deviations from the Contract Documents on submittals.

G. Additional Paper Copies: Unless additional copies are required for final submittal, and unless Architect observes noncompliance with provisions in the Contract Documents, initial submittal may serve as final submittal.

1. Submit one copy of submittal to concurrent reviewer in addition to specified number of copies to Architect.

H. Transmittal: Assemble each submittal individually and appropriately for transmittal and handling. Transmit each submittal using a transmittal form. Architect will discard submittals received from sources other than Contractor.

1. Transmittal Form: Use facsimile of sample form included in Project Manual.
2. Transmittal Form: Provide locations on form for the following information:

a. Project name.
b. Date.
c. Destination (To:).
d. Source (From:).
e. Names of subcontractor, manufacturer, and supplier.
f. Category and type of submittal.
g. Submittal purpose and description.
h. Specification Section number and title.
i. Indication of full or partial submittal.
j. Drawing number and detail references, as appropriate.
k. Transmittal number, numbered consecutively.
l. Submittal and transmittal distribution record.
m. Remarks.
n. Signature of transmitter.

3. On an attached separate sheet, prepared on Contractor's letterhead, record relevant information, requests for data, revisions other than those requested by Architect on previous submittals, and deviations from requirements in the Contract Documents, including minor variations and limitations. Include same identification information as related submittal.

I. Resubmittals: Make resubmittals in same form and number of copies as initial submittal.

1. Note date and content of previous submittal.
2. Note date and content of revision in label or title block and clearly indicate extent of revision.
3. Resubmit submittals until they are marked with “Reviewed” or “Reviewed as Noted” from Architect's action stamp.

J. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.

K. Use for Construction: Use only final submittals that are marked with “Reviewed” or “Reviewed as Noted” from Architect's action stamp.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.

1. Action Submittals: Submit pdf files.
2. Informational Submittals: Submit pdf files.

3. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Division 01 Section "Closeout Procedures."
4. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.

    a. Provide a notarized statement on original paper copy certificates and certifications where indicated.

5. Test and Inspection Reports Submittals: Comply with requirements specified in Division 01 Section "Quality Requirements."

B. Product Data: Collect information into a single submittal for each element of construction and type of product or equipment.

1. If information must be specially prepared for submittal because standard published data are not suitable for use, submit as Shop Drawings, not as Product Data.
2. Mark each copy of each submittal to show which products and options are applicable.
3. Include the following information, as applicable:

    a. Manufacturer’s written recommendations
    b. Manufacturer’s installation instructions.
    c. Manufacturer's catalog cuts.
    d. Manufacturer's product specifications.
    e. Standard color charts.
    f. Statement of compliance with specified referenced standards.
    g. Testing by recognized testing agency.
    h. Application of testing agency labels and seals.
    i. Notation of coordination requirements.
    j. Mill reports.
    k. Standard product operation and maintenance manuals.
    l. Compliance with specified referenced standards.
    m. Availability and delivery time information.

4. For equipment, include the following in addition to the above, as applicable:

    a. Wiring diagrams showing factory-installed wiring.
    b. Printed performance curves.
    c. Operational range diagrams.
    d. Clearances required to other construction, if not indicated on accompanying Shop Drawings.

5. Submit Product Data before or concurrent with Samples.
6. Submit Product Data in the following format:

    a. Electronic pdf format.

C. Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data.

1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:

    a. Dimensions
    b. Identification of products.
    c. Fabrications and installation drawings.
    d. Schedules.
    e. Compliance with specified standards.
    f. Roughing-in and setting diagrams.
    g. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
    h. Shopwork manufacturing instructions.
    i. Templates and patterns.

j. Design calculations.
k. Wiring Diagrams: Differentiate between manufacturer-installed and field-stalled.
l. Notation of coordination requirements.
m. Notation of dimensions established by field measurement.
n. Relationship and attachment to adjoining construction clearly indicated.
o. Seal and signature of professional engineer if specified.

2. Sheet Size: Except for templates, patterns, and similar full-size drawings, submit Shop Drawings on sheets at least 8-1/2 by 11 inches (215 by 280 mm) but no larger than 30 by 42 inches (750 by 1067 mm).
3. Submit Shop Drawings in the following format:

   a. Electronic pdf format.

4. Record Submittal: Following final approval of each submittal, email pdf of approved submission to project manager.

D. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.

1. Transmit Samples that contain multiple, related components such as accessories together in one submittal package.
2. Identification: Attach label on unexposed side of Samples that includes the following:

   a. Generic description of Sample.
   b. Product name and name of manufacturer.
   c. Sample source.
   d. Number and title of applicable Specification Section.

3. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.

   a. Samples that may be incorporated into the Work are indicated in individual Specification Sections. Such Samples must be in an undamaged condition at time of use.
   b. Samples not incorporated into the Work, or otherwise designated as Owner's property, are the property of Contractor.

4. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.

   a. Number of Samples: Submit one (1) full set of available choices where color, pattern, texture, or similar characteristics are required to be selected from manufacturer's product line. Architect will return one submittal with options selected.

5. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

   a. Number of Samples: Submit (1) set of Samples.

      1) Submit a single Sample where assembly details, workmanship, fabrication techniques, connections, operation, and other similar characteristics are to be demonstrated.

2) If variation in color, pattern, texture, or other characteristic is inherent in material or product represented by a Sample, submit at least three (3) sets of paired units that show approximate limits of variations.

E. Product Schedule or List: As required in individual Specification Sections, prepare a written summary indicating types of products required for the Work and their intended location. Include the following information in tabular form:

1. Type of product. Include unique identifier for each product.
2. Manufacturer and product name, and model number if applicable.
3. Number and name of room or space.
4. Location within room or space.
5. Submit product schedule in the following format:

a. Electronic pdf file.

F. Contractor's Construction Schedule: Comply with requirements specified in Division 01 Section "Construction Progress Documentation."

G. Application for Payment: Comply with requirements specified in Division 01 Section "Payment Procedures."

H. Schedule of Values: Comply with requirements specified in Division 01 Section "Payment Procedures."

I. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:

1. Name, address, and telephone number of entity performing subcontract or supplying products.
2. Number and title of related Specification Section(s) covered by subcontract.
3. Drawing number and detail references, as appropriate, covered by subcontract.
4. Submit subcontract list in the following format:

a. PDF electronic file.

J. Coordination Drawings: Comply with requirements specified in Division 01 Section "Project Management and Coordination."

K. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.

L. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on American Welding Society (AWS) forms. Include names of firms and personnel certified.

M. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.

N. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.

O. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

P. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.

Q. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.

R. Product Test Reports: Submit written reports indicating current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.

S. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:

1. Name of evaluation organization.
2. Date of evaluation.
3. Time period when report is in effect.
4. Product and manufacturers' names.
5. Description of product.
6. Test procedures and results.
7. Limitations of use.

T. Schedule of Tests and Inspections: Comply with requirements specified in Division 01 Section "Quality Requirements."

U. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.

V. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.

W. Field Test Reports: Submit reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.

X. Maintenance Data: Comply with requirements specified in Division 01 Section "Operation and Maintenance Data."

Y. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.

Z. Manufacturer’s Instructions: Prepare written or published information that documents manufacturer’s recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:

1. Preparation of substrates.
2. Required substrate tolerances.
3. Sequence of installation or erection.
4. Required installation tolerances.
5. Required adjustments.
6. Recommendations for cleaning and protection.

AA. Manufacturer’s Field Reports: Prepare written information documenting factory-authorized service representative’s tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

BB. Insurance Certificates and Bonds: Prepare written information indicating current status of insurance or bonding coverage. Include name of entity covered by insurance or bond, limits of coverage, amounts of deductibles, if any, and term of the coverage.

CC. Material Safety Data Sheets (MSDSs): Submit information directly to Owner; do not submit to Architect.

1. Architect will not review submittals that include MSDSs and will return the entire submittal for re-submittal.

2.2 DELEGATED-DESIGN SERVICES

A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.

1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.

B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit electronic pdf copy of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional.

1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

PART 3 - EXECUTION

3.1 CONTRACTOR'S REVIEW

A. Action and Informational Submittals: Review each submittal and check for coordination with other Work of the Contract and for compliance with the Contract Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to Architect.

B. Project Closeout and Maintenance/Material Submittals: Refer to requirements in Division 01 Section "Closeout Procedures."

C. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Contractor's approval, and statement certifying that submittal has been reviewed, checked, and approved for compliance with the Contract Documents.

3.2 ARCHITECT'S ACTION

A. General: Architect will not review submittals that do not bear Contractor's approval stamp and will return them without action.

B. Action Submittals: Architect will review each submittal, make marks to indicate corrections or modifications required, and return it. Architect will stamp each submittal with an action stamp and will mark stamp appropriately to indicate action, as follows:

1. Reviewed: Where submittals are marked “Reviewed,” action constitutes the Architect’s Final Unrestricted Release. The Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents. Final acceptance will depend on that compliance.
2. Reviewed as Noted: When submittals are marked “Reviewed as Noted,” action constitutes the Architect’s Final-but-Restricted Release. The Work covered by the submittal may proceed provided it complies with both the Architect’s notations and corrections on the submittal and the requirements of the Contract Documents. Final acceptance will depend on that compliance.
3. Revise and Resubmit: When submittal is marked “Revise and Resubmit,” action constitutes the Architect’s decision to require re-submittal. Do not proceed with the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal according to the Architect’s notations. Resubmit without delay. Repeat if necessary to obtain a different action mark.

    a. Do not permit submittals marked “Revise and Resubmit” to be used at the Project Site or elsewhere where construction is in progress.

4. Color Notification:
5. Rejected:
6. Returned without Review:
7. Other Action: Where a submittal is primarily for information or record purposes or for special processing or other contractor activity, the submittal will be returned, marked “Action Not Required.”

C. Informational Submittals: Architect will review each submittal and will not return it, or will return it if it does not comply with requirements. Architect will forward each submittal to appropriate party.

D. Partial submittals prepared for a portion of the Work will be reviewed when use of partial submittals has received prior approval from Architect.

E. Incomplete submittals are not acceptable, will be considered nonresponsive, and will be returned without review.

F. Submittals not required by the Contract Documents may not be reviewed and may be discarded.

END OF SECTION 01 33 00

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for quality assurance and quality control.

B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. The Contractor is responsible to coordinate testing agency's activities. Field quality control testing will be performed by Owner hired testing agency; all other testing is the responsibility of the prime contractor.

1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
3. Requirements for Contractor to provide quality-assurance and -control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
2. Division 01 Section "Execution" for repair and restoration of construction disturbed by testing and inspecting activities.
3. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.

B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Services do not include contract enforcement activities performed by Architect.

C. Mockups: Full size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.

1. Laboratory Mockups: Full-size, physical assemblies constructed at testing facility to verify performance characteristics.

2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on the project site, consisting of multiple products, assemblies and subassemblies.
3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.

D. Preconstruction Testing: Tests and inspections performed specifically for the Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

1. Contractor Shall Provide

E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.

1. Contractor Shall Provide

F. Source Quality-Control Testing: Tests and inspections that are performed at the source, i.e., plant, mill, factory, or shop.

1. Contractor Shall Provide

G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.

1. Owner hired Testing Agency shall provide testing on soils, concrete, masonry & roof. Contractors shall provide all other Field Quality Control Testing.

H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.

I. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.

1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade or trades.

J. Experienced: When used with an entity or individual, "experienced" means having successfully completed a minimum of five (5) previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

1.4 CONFLICTING REQUIREMENTS

A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Architect for a decision before proceeding.

B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.5 ACTION SUBMITTALS

A. Qualification Data: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.

B. Shop Drawings: For integrated exterior mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.

1. Indicate manufacturer and model number of individual components.

1.6 INFORMATIONAL SUBMITTALS

A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.

B. Contractor's Quality-Control Manager Qualifications: For supervisory personnel.

C. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.7 CONTRACTOR'S QUALITY-CONTROL PLAN

A. Where quality-control services are indicated to be provided by contractor, engage a qualified testing agency to perform these services.

1. Owner provided testing is limited to soil compaction tests required in areas of new construction.

B. Provide quality-control services specified and those required by authorities having jurisdiction. Contractor shall perform all quality-control services required by authorities having jurisdiction, whether specified or not.

1. Engage a qualified testing agency to perform these quality-control services.
2. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspecting will be performed.
3. Submit a certified written report, in duplicate, of each quality-control service.
4. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
5. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

C. Testing and Inspection: Include in quality-control plan a comprehensive schedule of Work requiring testing or inspection, including the following:

1. Contractor-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections.
2. Special inspections required by authorities having jurisdiction and indicated on the "Statement of Special Inspections."
3. Owner-performed tests and inspections indicated in the Contract Documents.

D. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.

E. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Architect has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.8 REPORTS AND DOCUMENTS

A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:

1. Date of issue.
2. Project title and number.
3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and re-inspecting.

B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. Permits, Licenses, and Certificates: For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work. Submit in electronic pdf format.

1.9 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: The Owner will engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Owner, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, to include a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and re-inspecting corrected work.

1.10 QUALITY ASSURANCE

A. General: Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.

D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.

E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.

F. Specialists: Certain Specification Sections require that specific construction activities shall be performed by entities who are recognized experts in those operations. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.

1. Requirements of authorities having jurisdiction shall supersede requirements for specialists.

G. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 548; and with additional qualifications specified in individual Sections; and where required by authorities having jurisdiction, that is acceptable to authorities.

1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.

H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.

J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:

1. Contractor responsibilities include the following:

    a. Provide test specimens representative of proposed products and construction.
    b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
    c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
    d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
    e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
    f. When testing is complete, remove test specimens, assemblies, mockups; do not reuse products on Project.

2. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups in location and of size indicated or, if not indicated, as directed by Architect.
2. Notify Architect five (5) days in advance of dates and times when mockups will be constructed.
3. Employ supervisory personnel who will oversee mockup construction. Employ workers that will be employed during the construction at the Project.
4. Demonstrate the proposed range of aesthetic effects and workmanship.
5. Obtain Architect's approval of mockups before starting work, fabrication, or construction.

    a. Allow five (5) days for initial review and each re-review of each mockup.
    b. Coordinate construction of mock-up with progress meetings.

6. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
7. Demolish and remove mockups when directed, unless otherwise indicated.

L. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections in Divisions 02 through 33.

1.11 QUALITY CONTROL

A. Contractor Responsibilities: Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Where services are not indicated as Owner’s responsibility, engage a qualified testing agency to perform these quality-control services.
3. Notify testing agencies at least twenty-four 24 hours in advance of time when Work that requires testing or inspecting will be performed.

4. Where quality-control services are Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.

    a. Contractor shall not engage same entity as Owner, unless agreed to in writing by the Owner.

5. Testing and inspecting requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

B. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Division 01 Section "Submittal Procedures."

C. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in pre-installation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.

D. Retesting/Re-inspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.

E. Testing Agency Responsibilities: Cooperate with Architect and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.

1. Notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
2. Determine the location from which test samples will be taken and in which in-situ tests are conducted.
3. Conduct and interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from requirements.
4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
6. Do not perform any duties of Contractor.

F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:

1. Access to the Work.
2. Incidental labor and facilities necessary to facilitate tests and inspections.
3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
4. Facilities for storage and field curing of test samples.
5. Delivery of samples to testing agencies.
6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
7. Security and protection for samples and for testing and inspecting equipment at Project site.

G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.

1. Schedule times for tests, inspections, obtaining samples, and similar activities.

H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents as a component of the Contractor's quality-control plan. Coordinate and submit concurrently with Contractor's construction schedule. Update as the Work progresses. .

1. Distribution: Distribute schedule to Owner, Architect, Construction Manager, Project Manager, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

A. Special Tests and Inspections: The Owner will employ a qualified testing agency as required by authorities having jurisdiction, as indicated in individual Specification Sections, and as follows:

1. Verifying that manufacturer maintains detailed fabrication and quality-control procedures and reviewing the completeness and adequacy of those procedures to perform the Work.
2. Notifying Architect and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
3. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect with copy to Contractor and to authorities having jurisdiction.
4. Submitting a final report of special tests and inspections at Substantial Completion, to include a list of unresolved deficiencies.
5. Interpreting tests and inspections and stating in each report whether tested and inspected work complies with or deviates from the Contract Documents.
6. Retesting and re-inspecting corrected work.

B. Owner shall provide testing services for soil testing and inspection.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

A. Prepare a record of tests and inspections. Include the following:

1. Date test or inspection was conducted.
2. Description of the Work tested or inspected.
3. Date test or inspection results were transmitted to Architect.
4. Identification of testing agency or special inspector conducting test or inspection.

B. Maintain log at Project site. Post changes and modifications as they occur. Provide access to test and inspection log for Architect's reference during normal working hours.

3.2 REPAIR AND PROTECTION

A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.

1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."

B. Protect construction exposed by or for quality-control service activities.

C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 42 00 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

A. General: Basic Contract definitions are included in the Conditions of the Contract.

B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.

C. "Directed": A command or instruction by Architect. Other terms, including "requested," "authorized," "selected," "required," and "permitted," have the same meaning as "directed."

D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms, including "shown," "noted," "scheduled," and "specified," have the same meaning as "indicated."

E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.

F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.

G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.

H. "Provide": Furnish and install, complete and ready for the intended use.

I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.

B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

1. For standards referenced by applicable building codes, comply with dates of standards as listed in building codes.

C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.

1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

A. Industry Organizations, List: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Abbreviations and acronyms not included in this list are to mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States." The information in this list is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. AABC - Associated Air Balance Council; www.aabc.com.
2. AAMA - American Architectural Manufacturers Association; (see FGIA).
3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
7. ABMA - American Boiler Manufacturers Association; www.abma.com.
8. ACI - American Concrete Institute; www.concrete.org.
9. ACP - American Clean Power; (Formerly: American Wind Energy Association); www.cleanpower.org.
10. ACPA - American Concrete Pipe Association; www.concretepipe.org.
11. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
12. AF&PA - American Forest & Paper Association; www.afandpa.org.
13. AGA - American Gas Association; www.aga.org.
14. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
15. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
16. AI - Asphalt Institute; www.asphaltinstitute.org.
17. AIA - American Institute of Architects (The); www.aia.org.
18. AISC - American Institute of Steel Construction; www.aisc.org.
19. AISI - American Iron and Steel Institute; www.steel.org.
20. AITC - American Institute of Timber Construction; (see PLIB).
21. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
22. AMPP - Association for Materials Protection and Performance; www.ampp.org.
23. ANSI - American National Standards Institute; www.ansi.org.
24. AOSA/SCST - Association of Official Seed Analysts (The)/Society of Commercial Seed Technologists (The); www.analyzeseeds.com.
25. APA - APA - The Engineered Wood Association; www.apawood.org.
26. APA - Architectural Precast Association; www.archprecast.org.
27. API - American Petroleum Institute; www.api.org.
28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
29. ASA - Acoustical Society of America; www.acousticalsociety.org.
30. ASCE - American Society of Civil Engineers; www.asce.org.
31. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (see ASCE).
32. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
33. ASME - ASME International; [American Society of Mechanical Engineers (The)]
34. ASSE - ASSE International; (American Society of Sanitary Engineering); www.asse-plumbing.org.
35. ASSP - American Society of Safety Professionals; www.assp.org.
36. ASTM - ASTM International; www.astm.org.
37. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
38. AVIXA - Audiovisual and Integrated Experience Association; www.avixa.org.
39. AWI - Architectural Woodwork Institute; www.awinet.org.
40. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
41. AWPA - American Wood Protection Association; www.awpa.com.
42. AWS - American Welding Society; www.aws.org.
43. AWWA - American Water Works Association; www.awwa.org.
44. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
45. BIA - Brick Industry Association (The); www.gobrick.com.
46. BICSI - BICSI, Inc.; www.bicsi.org.
47. BIFMA - Business and Institutional Furniture Manufacturer's Association; www.bifma.org.
48. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
49. BWF - Badminton World Federation; www.bwfbadminton.com.

50. CARB - California Air Resources Board; www.arb.ca.gov.
51. CDA - Copper Development Association Inc.; www.copper.org.
52. CE - Conformite Europeenne (European Commission); www.ec.europa.eu/growth/single-market/ce-marking.
53. CEA - Canadian Electricity Association; www.electricity.ca.
54. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
55. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
56. CGA - Compressed Gas Association; www.cganet.com.
57. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
58. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
59. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
60. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
61. CPA - Composite Panel Association; www.compositepanel.org.
62. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
63. CRRC - Cool Roof Rating Council; www.coolroofs.org.
64. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
65. CSA - CSA Group; www.csagroup.org.
66. CSI - Cast Stone Institute; www.caststone.org.
67. CSI - Construction Specifications Institute (The); www.csiresources.org.
68. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
69. CTA - Consumer Technology Association; www.cta.tech.
70. CTI - Cooling Technology Institute; www.coolingtechnology.org.
71. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
72. DHA - Decorative Hardwoods Association; www.decorativehardwoods.org.
73. DHI - Door and Hardware Institute; www.dhi.org.
74. ECIA - Electronic Components Industry Association; www.ecianow.org.
75. EIMA - EIFS Industry Members Association; www.eima.com.
76. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
77. EOS/ESD - EOS/ESD Association, Inc.; Electrostatic Discharge Association; www.esda.org.
78. ESTA - Entertainment Services and Technology Association; www.esta.org.
79. EVO - Efficiency Valuation Organization; www.evo-world.org.
80. FCI - Fluid Controls Institute; www.fluidcontrolsinstitute.org.
81. FGIA - Fenestration and Glazing Industry Alliance; https://fgiaonline.org.
82. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
83. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
84. FM Approvals - FM Approvals LLC; www.fmapprovals.com.
85. FM Global - FM Global; www.fmglobal.com.
86. FRSA - Florida Roofing and Sheet Metal Contractors Association, Inc.; www.floridaroof.com.
87. FSA - Fluid Sealing Association; www.fluidsealing.com.
88. FSC - Forest Stewardship Council U.S.; www.fscus.org.
89. GA - Gypsum Association; www.gypsum.org.
90. GS - Green Seal; www.greenseal.org.
91. HI - Hydraulic Institute; www.pumps.org.
92. HMMA - Hollow Metal Manufacturers Association; (see NAAMM).
93. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
94. IAS - International Accreditation Service; www.iasonline.org.
95. ICC - International Code Council; www.iccsafe.org.
96. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
97. ICPA - International Cast Polymer Association (The); www.theicpa.com.
98. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
99. IEC - International Electrotechnical Commission; www.iec.ch.
100. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
101. IES - Illuminating Engineering Society; www.ies.org.
102. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
103. IGMA - Insulating Glass Manufacturers Alliance; (see FGIA).
104. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.org.
105. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
106. Intertek - Intertek Group; www.intertek.com.
107. ISA - International Society of Automation (The); www.isa.org.
108. ISFA - International Surface Fabricators Association; www.isfanow.org.

109. ISO - International Organization for Standardization; www.iso.org.
110. ITU - International Telecommunication Union; www.itu.int.
111. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
112. LPI - Lightning Protection Institute; www.lightning.org.
113. MBMA - Metal Building Manufacturers Association; www.mbma.com.
114. MCA - Metal Construction Association; www.metalconstruction.org.
115. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
116. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
117. MHI - Material Handling Industry; www.mhi.org.
118. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
119. MPI - Master Painters Institute; www.paintinfo.com.
120. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry, Inc.; www.msshq.org.
121. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
122. NACE - NACE International; (National Association of Corrosion Engineers International); (see AMPP).
123. NADCA - National Air Duct Cleaners Association; www.nadca.com.
124. NAIMA - North American Insulation Manufacturers Association; www.insulationinstitute.org.
125. NALP - National Association of Landscape Professionals; www.landscapeprofessionals.org.
126. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
127. NBI - New Buildings Institute; www.newbuildings.org.
128. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
129. NCMA - National Concrete Masonry Association; www.ncma.org.
130. NEBB - National Environmental Balancing Bureau; www.nebb.org.
131. NECA - National Electrical Contractors Association; www.necanet.org.
132. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
133. NEMA - National Electrical Manufacturers Association; www.nema.org.
134. NETA - InterNational Electrical Testing Association; www.netaworld.org.
135. NFHS - National Federation of State High School Associations; www.nfhs.org.
136. NFPA - National Fire Protection Association; www.nfpa.org.
137. NFPA - NFPA International; (see NFPA).
138. NFRC - National Fenestration Rating Council; www.nfrc.org.
139. NGA - National Glass Association; www.glass.org.
140. NHLA - National Hardwood Lumber Association; www.nhla.com.
141. NLGA - National Lumber Grades Authority; www.nlga.org.
142. NOFMA - National Oak Flooring Manufacturers Association; (see NWFA).
143. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
144. NRCA - National Roofing Contractors Association; www.nrca.net.
145. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
146. NSF - NSF International; www.nsf.org.
147. NSI - Natural Stone Institute; www.naturalstoneinstitute.org.
148. NSPE - National Society of Professional Engineers; www.nspe.org.
149. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
150. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
151. NWFA - National Wood Flooring Association; www.nwfa.org.
152. NWRA - National Waste & Recycling Association; www.wasterecycling.org.
153. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
154. PDI - Plumbing & Drainage Institute; www.pdionline.org.
155. PLASA - PLASA; www.plasa.org.
156. PLIB - Pacific Lumber Inspection Bureau; www.plib.org.
157. PVCPA - Uni-Bell PVC Pipe Association; www.uni-bell.org.
158. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
159. RFCI - Resilient Floor Covering Institute; www.rfci.com.
160. RIS - Redwood Inspection Service; (see WWPA).
161. SAE - SAE International; www.sae.org.
162. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
163. SDI - Steel Deck Institute; www.sdi.org.
164. SDI - Steel Door Institute; www.steeldoor.org.
165. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
166. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (see ASCE).
167. SIA - Security Industry Association; www.securityindustry.org.
168. SJI - Steel Joist Institute; www.steeljoist.org.

169. SMA - Screen Manufacturers Association; www.smainfo.org.
170. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
171. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
172. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
173. SPIB - Southern Pine Inspection Bureau; www.spib.org.
174. SPRI - Single Ply Roofing Industry; www.spri.org.
175. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
176. SSINA - Specialty Steel Industry of North America; www.ssina.com.
177. SSPC - SSPC: The Society for Protective Coatings; (see AMPP).
178. STI/SPFA - Steel Tank Institute/Steel Plate Fabricators Association; www.steeltank.com.
179. SWI - Steel Window Institute; www.steelwindows.com.
180. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
181. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
182. TCNA - Tile Council of North America, Inc.; www.tcnatile.com.
183. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.kbcdco.tema.org.
184. TIA - Telecommunications Industry Association (The); www.tiaonline.org.
185. TMS - The Masonry Society; www.masonrysociety.org.
186. TPI - Truss Plate Institute; www.tpinst.org.
187. TPI - Turfgrass Producers International; www.turfgrasssod.org.
188. TRI - Tile Roofing Industry Alliance; www.tileroofing.org.
189. UL - Underwriters Laboratories Inc.; www.ul.org.
190. UL LLC - UL LLC; www.ul.com.
191. USAV - USA Volleyball; www.usavolleyball.org.
192. USGBC - U.S. Green Building Council; www.usgbc.org.
193. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
194. WA - Wallcoverings Association; www.wallcoverings.org.
195. WCLIB - West Coast Lumber Inspection Bureau; (see PLIB).
196. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
197. WDMA - Window & Door Manufacturers Association; www.wdma.com.
198. WI - Woodwork Institute; www.woodworkinstitute.com.
199. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.
200. WWPA - Western Wood Products Association; www.wwpa.org.

B. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

C. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. CPSC - U.S. Consumer Product Safety Commission; www.cpsc.gov.
2. DOC - U.S. Department of Commerce; www.commerce.gov.
3. DOD - U.S. Department of Defense; www.defense.gov.
4. DOE - U.S. Department of Energy; www.energy.gov.
5. DOJ - U.S. Department of Justice; www.ojp.usdoj.gov
6. DOS - U.S. Department of State; www.state.gov.
7. EPA - United States Environmental Protection Agency; www.epa.gov.
8. FAA - Federal Aviation Administration; www.faa.gov.
9. GPO - U.S. Government Publishing Office; www.gpo.gov.
10. GSA - U.S. General Services Administration; www.gsa.gov.
11. HUD - U.S. Department of Housing and Urban Development; www.hud.gov.
12. LBNL - Lawrence Berkeley National Laboratory; Energy Technologies Area; www.lbl.gov/.
13. NIST - National Institute of Standards and Technology; www.nist.gov.
14. OSHA - Occupational Safety & Health Administration; www.osha.gov.

15. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
16. USACE - U.S. Army Corps of Engineers; www.usace.army.mil.
17. USDA - U.S. Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
18. USDA - U.S. Department of Agriculture; Rural Utilities Service; www.usda.gov.
19. USP - U.S. Pharmacopeial Convention; www.usp.org.
20. USPS - United States Postal Service; www.usps.com.

D. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from U.S. Government Publishing Office; www.govinfo.gov.
2. DOD - U.S. Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.dsp.dla.mil/Specs-Standards/.
3. DSCC - Defense Supply Center Columbus; (see FS).
4. FED-STD - Federal Standard; (see FS).
5. FS - Federal Specification; Available from DLA Document Services; www.dsp.dla.mil/Specs-Standards/.

    a. Available from Defense Standardization Program; www.dsp.dla.mil.
    b. Available from U.S. General Services Administration; www.gsa.gov.
    c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org.

6. MILSPEC - Military Specification and Standards; (see DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (see USAB).

E. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they are to mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. BEARHFTI; California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; (see BHGS).
2. BHGS; State of California Bureau of Household Goods and Services; (Formerly: California Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation); www.bhgs.dca.ca.gov.
3. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.oal.ca.gov/publications/ccr/.
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHLB/IAQ/Pages/Main-Page.aspx.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; https://tfsweb.tamu.edu/.

PART 2 - EXECUTION (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 42 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

B. Related Sections:

1. Section 01 10 00 “Contract Summary” for limitations on utility interruptions and other work restrictions.
2. Section 01 12 00 "Multiple Contract Summary" for work restrictions and limitations on utility interruptions.
3. Section 01 33 00 “Submittal Procedures” for procedures for submitting copies of implementation and termination schedule and utility reports.
4. Section 01 73 00 “Execution Requirements” for progress cleaning requirements.
5. Divisions 02 through 33 Sections for temporary heat, ventilation, and humidity requirements for products in those Sections.
6. Section 31 23 19 "Dewatering" for disposal of ground water at Project site.
7. Section 32 12 16 “Asphalt Paving” for construction and maintenance of asphalt paving for temporary roads and paved areas.

1.3 DEFINITIONS

A. Permanent Enclosure: As determined by Architect, permanent or temporary roofing is complete, insulated, and weathertight; exterior walls are insulated and weathertight; and all openings are closed with permanent construction or substantial temporary closures.

1.4 USE CHARGES

A. General: Cost or use charges for temporary facilities are the responsibility of the Owner. Comply with the following. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Owner’s Project Manager, Architect, occupants of Project, testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from existing water system is available for use. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from existing system is available for use. Provide connections and extensions of services as required for construction operations.

1. Temporary Telephone and Data Service: Prime Contractors are responsible for use charges at each of their respective Field Offices. Use charges for Temporary Field Offices for the Owner’s Representative (for use by Owner and Architect) will be paid by the General Contractor.

2. Temporary utilities are to be maintained in the Staging Area to support Field Offices until Final Completion.

D. Sewer Service: Sewage waste disposal for construction activities shall be the responsibility of the General Contractor.

E. Electric Power Service: The Electrical Contractor shall furnish and install a temporary electric service that is appropriately sized for all the construction related activities.

F. Natural Gas Service: Gas from the new system brought to the site is not permitted to be utilized for temporary heat unless a meter is installed, and usage costs are paid for by the Contractor providing the temporary heating.

G. Fire Safety: General Contractor shall provide and manage fire prevention program.

1.5 INFORMATIONAL SUBMITTALS

A. Site Plan: General Contractor shall prepare and show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel. Plan must coordinate with land development plans and phasing and be approved by the Owner prior to implementation. The site staging plan shall be submitted for Owner review (5) five days min. prior to pre-construction conference.

B. Erosion- and Sedimentation-Control Plan: General Contractor shall prepare and show compliance with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.

C. Fire-Safety Program: General Contractor shall show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Contractor personnel responsible for management of fire-prevention program.

D. Moisture-Protection Plan: Each Prime Contractor shall describe procedures and controls for protecting materials and construction from water absorption and damages.

1. Describe procedures and controls for protecting materials and construction from water absorption and damage, including delivery, handling, and storage provisions for materials subject to water absorption or water damage.
2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water damaged Work.
3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.

E. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust-control measures proposed for use in areas adjacent to occupied portions of site, including proposed equipment locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Including the following:

1. Waste handling procedures.
2. Dust-control measures.
3. Should dust mitigation efforts be required by the Lancaster County Dept. of Health and testing is required, the Contractor shall be responsible for the cost of said mitigation, testing, future inspections or any imposed fees or fines.

F. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

G. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 QUALITY ASSURANCE

A. Temporary Heat and Dehumidifying Equipment Supplier Qualifications: Engage a supplier experienced in supplying temporary heating and humidifying equipment and with the engineering and testing capabilities to recommend equipment sizes, predict fuel loads, predict humidity levels and test indoor air quality.

B. Standards: Comply with ANSI A10.6, NECA's "Temporary Electrical Facilities," and NFPA 241.

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

D. Accessible Temporary Egress: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC/ANSI A117.1. In case of a conflict, the most stringent applies or as interpreted by the Code Administrator for the project.

1.7 PROJECT CONDITIONS

A. Temporary Utilities: At Substantial Completion and when acceptable to the Owner, Architect, Engineers and Prime Contractors, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: Prime Contractors shall engage installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

2. Permanent Facilities Permitted for Temporary Use:

a. Power Distribution System, subject to use that does not overload system.
b. Water Distribution System, only from janitor's closets and mechanical rooms.
c. Permanent Lighting, only after completion of painting.
d. No other permanent facilities are permitted to be used.

B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:

1. Keep temporary services and facilities clean and neat.
2. Relocate temporary services and facilities as required by progress of the Work.

1.8 SEQUENCING

A. Obtain permits for and install temporary project identification signs no later than 15 days after notice to proceed.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Architect. Provide materials suitable for use intended.

B. Pavement: Comply with Division 32 pavement Sections.

C. Lumber and Plywood: Comply with requirements in Division 06 Section "Rough Carpentry."

D. Paint: Comply with requirements in Division 09 painting Sections.

E. Tarpaulins: Fire-resistive labeled with flame-spread rating of 15 or less.

F. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized steel, chain-link fabric fencing; minimum 8 feet (2.4 m) high with galvanized steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide concrete bases for supporting posts.

G. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10 mils (0.25 mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84.

H. Dust Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).

I. Insulation: Unfaced mineral-fiber blanket, manufactured from glass, slag wool, or rock wool; with maximum flame-spread and smoke-developed indexes of 25 and 50, respectively.

J. Water: Potable.

2.2 TEMPORARY FACILITIES

A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

B. Contractor Field Offices: Mobile units sized and equipped at the discretion of the Contractor. Units shall be kept clean, orderly and in good service.

1. Each Contractor shall equip and maintain its own field office, if required, with the following:

a. Telephone service with automated answering capabilities. Superintendent’s cellular phone service may serve this purpose.
b. Internet Access via DSL connection with email capabilities allowing the Project Superintendent to receive digital correspondence.
c. Internal electrical distribution system terminating at an exterior mounted weatherproof heavy duty NEMA 3R disconnect.

C. Common-Use Field Office: Of sufficient size to accommodate needs of Owner’s Representative and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly.

1. The General Contractor shall arrange for facilities, furnishings and equipment for a temporary job site office accessible for use by the Owner, Architects or Engineers when on site, as well as job conferences and other project related meetings. The General Contractor shall pay all costs for procurement and all costs of the operations and maintenance of the office facility.

a. Trailer with an office at each end, full skirting, tie-downs, two sets of steps serving lockable entrance to the common middle space and Owner’s Representative Office (provide a locking bar at each door), operable windows with security screens, insect screens and mini-blinds at

each window, fully insulated and weathertight, resilient floor covering, paneled walls, acoustical ceiling, fluorescent light fixtures that deliver an average illumination of 20 fc at desk height, duplex receptacles (110-120V) at maximum distance apart of 12' and a minimum of 1 on each wall in each room. Trailer to be approved by Owner prior to ordering.

b. Trailer shall have heat and air conditioning to maintain temperature in the range of 68-78 degrees F. Provide 100-Amp, Three Phase electric service with no less than eight (8) duplex convenience outlets.

c. Arrange for cleaning services not less than bi-weekly. Dispose of trash weekly. Pay all costs of telephone, internet service provider, electric, water, and sewer service. (Electric meter installation and connection by Electrical Contractor.)

d. Provide the following minimum equipment and furnishings:

1) Tables for job meetings to seat 20.
2) Twenty Straight Chairs for job meetings.
3) Two (2) Plan Racks (Plan Hold stick set.) (One for Owner's Rep.).
4) Tw (2) Plan Tables 36" x 96" with stool (One for Owner's Rep.).
5) One Construction First Aid Kit for 25-50 people rating. ANSI Z308.1 compliant.
6) Bottled drinking water, regular delivery bottled water supply and service.
7) One all-in-one color printer, copier, scanner Epson model #WF-7620 or equal. Provide ink cartridges as needed.
8) Two desks with adjustable executive office chairs. Desks shall have drawers on one side.
9) One side table
10) One shelving unit – 48" in width, 60 " in height
11) One locking 4-drawer filing legal size filing cabinet.
12) One microwave – Sharp 1.1 cubic feet model #R309YK or equal.
13) One compact refrigerator 2.6 cubic feet.
14) Provide snow removal from the office trailer to the job site
15) Provide one inspected fire extinguisher

e. Telephone/Internet Services:

1) Provide high speed internet service with a Wi-Fi router capable of supporting multiple users.

f. The Owner's Representative will have the keys and use of this trailer.

B. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

1. Store combustible materials apart from building.

C. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.

D. Self-Contained Toilet Units: Single-occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material. Toilet unit shall be cleaned no less than weekly. Provide hand sanitizer as required.

E. Drinking-Water Fixtures: Containerized, tap-dispenser, bottled-water drinking-water units, including paper cup supply.

1. Where power is accessible, provide electric water coolers to maintain dispensed water temperature at 45 to 55 deg F.

F. Electrical Outlets: Properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher-voltage outlets; equipped with ground-fault circuit interrupters, reset button, and pilot light.

G. Power Distribution System Circuits: Where permitted and overhead and exposed for surveillance, wiring circuits, not exceeding 125-V ac, 20-A rating, and lighting circuits may be nonmetallic sheathed cable.

H. Internet/E-Mail Access: Provide at least one member of contractors' management team, in addition to the Site Superintendent, actively working on this project with e-mail address and internet access.

1. The Lead Contractor shall make available a list of important e-mail addresses to prime contractors, the Owner, Architect, Architect's consultants. Each contractor shall post e-mail list at each point of e-mail access, General Contractor shall post e-mail list at Temporary Field Office and Temporary Field Meeting Trailer.

2.3 TEMPORARY HEATING AND DEHUMIDIFYING EQUIPMENT

A. Permanent systems may not be used for temporary heating and dehumidifying, except as outlined in Section 01 12 00 "Multiple Contract Summary".

B. HVAC Equipment: Provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control. Units shall be located outside of the building and ducted in. Obtain approval by local officials for system.

1. Use of electric heaters, gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
2. Heating Units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
3. Permanent HVAC System: Use of permanent HVAC system is prohibited in areas of construction.

    a. Owner may authorize use of permanent HVAC system for temporary use during construction, only after area is dust free during finish installation. Provide filter with MERV thirteen (13) at each return-air grille and/or outside air intake in system and remove at end of construction and clean HVAC system as required in Section 01 77 00 "Closeout Procedures".
    b. 100% outside air shall be used whenever possible to minimize recirculation of air from the building.

C. Equipment Supplier: Provide systems from qualified supplier including, but not limited to the following:

1. Temp-Air (Temp-Heat, Temp-Cool).
2. Topp Construction Services, Inc.

D. Temporary Heating Equipment: Provide system engineered by temporary equipment supplier for expected conditions and interior environment requirements specified. Provide one of the following types:

1. Vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
2. Direct fired, makeup air, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control. System shall achieve not less than one complete air change every two hours in space served. System shall not raise CO and CO_2 levels above those mandated by OSHA for worker safety; shall not raise humidity level above specified range; and shall not recycle heated air into building – system intake shall include only fresh outside air.

    a. Include daily measurement of interior humidity, CO and CO_2 levels. Report excessive humidity, CO and CO_2 levels to equipment supplier and arrange immediate remedy.

3. Use of gasoline-burning space heaters, open-flame heaters, salamander-type heating or other recirculating and non-vented heating units is prohibited.
4. Heating Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.

E. Temporary Dehumidifying Equipment: Provide system engineered by temporary equipment supplier for expected conditions and interior environment requirements specified. Provide self-contained, recirculating refrigeration units with water collection and filtration capabilities.

1. Equipment shall be sized with sufficient moisture extraction capabilities to maintain ambient interior air within specified relative humidity range.
2. Cooling Units: Listed and labeled, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use for type of fuel being consumed.
3. Provide generators sized to power equipment where temporary electric service is not of sufficient capacity.
4. Provide collection and/or drainage capabilities to prevent condensate from re-evaporating in conditioned space or from spilling on floors.

F. Air-Filtration Units: Primary and secondary HEPA-filter-equipped portable units with four-stage filtration. Provide single switch for emergency shutoff. Configure to run continuously.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Use qualified personnel for installation of temporary facilities.

B. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

1. Locate facilities to limit site disturbance as specified in Section 01 12 00 "Multiple Contract Summary."

C. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Engage appropriate local utility company to install temporary service or connect to existing service. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.

1. Arrange with Utility Company, Owner, and existing users for time when service can be for time when service can be interrupted, if necessary, to make connections for temporary services.
2. Provide adequate capacity at each stage of construction.
3. If there are delays in establishing Temporary utilities at the Staging Area within (30) days of NTP, temporary service through other means must be provided by the Electrical Contractor in order for regular construction activities to continue.

B. Water Service: The Site and Athletics Contractor shall provide temporary water services until permanent water system is installed and tested.

1. Coordinate with Owner and Water Authority for connection of Temporary Service. The contractor may pipe off the incoming water services lines.
2. Install, a temporary 2-inch diameter line to a point 3-feet above grade, and install a temporary water meter, and ¾-inch diameter hose bibs, in a quantity sufficient to accommodate requirements of all construction activities of the prime contractors. Type and installation of water meter shall be acceptable to Water Authority.
3. After items 1 and 2 are completed and tested maintain the temporary water line, meter and hose bibs.
4. After the permanent water meter and main shut-off valves are installed within the building, remove the temporary 2-inch diameter water line, water meter and hose bibs. Make connection to the permanent line.
5. Provide and maintain temporary hose bibs spaced so water can be reached with a 100-foot (30-m) hose. Provide hose bibs not more than 200 feet apart within the building footprint.

6. As soon as water is required at each level, extend service to form a temporary water- and fire-protection standpipe. Provide distribution piping.
7. Where installations below an outlet might be damaged by spillage or leakage, provide a drip pan of suitable size to minimize water damage. Drain accumulated water promptly from pans.
8. Provide pumps to supply a minimum of 30-psi static pressure at highest point. Equip pumps with surge and storage tanks and automatic controls to supply water uniformly at reasonable pressures.
9. Temporary water service may be used by all entities engaged in construction activities at the Project Site.
10. Remove temporary hose bibs when they are no longer needed.
11. Provide rubber hoses as necessary to serve Project site.

C. Sanitary Facilities: The Site and Athletics Contractor shall provide temporary toilets, wash facilities, and drinking- water fixtures. Comply with regulations and health codes for type, number, location, operation, and maintenance of fixtures and facilities.

1. A minimum of two (2) temporary toilet units shall be provided.
2. Use of pit-type privies shall not be permitted.
3. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
4. Toilets: Install self-contained toilet units. Shield toilets to ensure privacy. Provide separate facilities for male and female personnel.
5. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.

    a. Provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.

6. Locate toilets and drinking-water fixtures so personnel need not walk more than 200 feet horizontally to facilities.
7. Use of Owner's facilities is not permitted.
8. Refer to Paragraph 1.4 of this specification section regarding contractors' responsibilities for sewer service.

D. Drinking-Water Facilities: The Site and Athletics Contractor shall provide Temporary Drinking Water Facilities.

1. Provide bottled-water, drinking-water units.

E. Provide temporary ventilation and humidity control. Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select safe equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.

1. Provide dehumidification when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
2. Refer to requirements of finishes, casework and equipment to condition space for installation.

F. Temporary Heating, Cooling and Humidity Control: Provide heat, ventilation, cooling and humidity control services necessary for the protection of the work and/or the construction activity.

1. Provide temporary heating, ventilation, cooling and humidity control required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity.

    a. Prior to enclosure of structure, structures or portions thereof, and when official local weather predictions indicate below freezing temperatures, the Contractor for the General Construction shall provide, maintain, operate and pay all costs including fuel to supply

temporary heat where these utilities are determined to be necessary for the protection of the work and/or the construction activity as determined by the Architect

b. Prior to permanent enclosure, maintain a minimum temperature of 50 deg F in the enclosed portions of building for normal construction activities, and 65 deg F for finishing activities and areas where finished Work has been installed.
c. Maintain a minimum temperature of 65 deg F in permanently enclosed portions of building.
d. A structure shall be considered to be enclosed when

    1) the roof is on and water tight;
    2) the exterior Stud and/or Masonry Walls have been complete;
    3) when openings, doors and windows are closed with permanent closures, or with substantial temporary closures which will affect the retention of heat within the structure (minimum of 6 mil polyvinyl covers).

e. Temporary heat will be required on a 24 hour basis when the ambient temperature is predicted or is actually at 35 deg. F or lower.

2. After the structure is permanently enclosed and temporary heat is required for proper construction as determined by the Architect, the General Contractor shall, at his own cost and expense, provide the equipment and labor for the temporary heat, ventilation, cooling and humidity control. The General Contractor may install gas fired portable heating units provided the products of combustion are totally vented outside the building(s). Select equipment that will not have an adverse effect on completed installations or elements being installed

    a. The General Contractor shall provide, at his cost, all fuel for temporary heating, ventilating, cooling and humidity control systems.
    b. Unless otherwise indicated or required by construction activities, temporary heat, ventilation and humidity control system shall be of sufficient capacity to heat the interior of the structure to 65 deg. F. when the outside temperature is 0 deg. F. Temperature at all items must be 65 deg. F or above. This service shall be continued until the entire project is completed.
    c. Unless otherwise indicated or required by construction activities, temporary HVAC system shall be of sufficient capacity to heat/cool the interior of the structure to 65 deg. F. Temperature at all items must be 65 deg. F or above. This service shall be continued until the entire project is completed.
    d. Where electricians, or plumbers are required to install, operate, supervise or maintain equipment used in the provision of temporary heat, ventilation, cooling or humidity control systems, the payment for the services of such personnel shall be the responsibility of the Contractor.
    e. The use of temporary or permanent electric resistance heating will not be permitted for temporary heat. Where permanent electric resistance heating is specified, temporary heat shall be independent of the permanent system.
    f. If approved by the Owner, Architect and Owner’s Representative permanent HVAC heating equipment used to supply temporary heat, ventilation, cooling and humidity control shall be completely cleaned and reconditioned by the Contractor prior to final acceptance. All permanent heating equipment such as radiator trap seats and diaphragms, valve seats and discs, strainer internals or any other equipment found to be damaged or fouled due to being used for temporary heat shall be replaced.
    g. Comply with requirements of items specified in Divisions 05 through 14 for individual requirements associated with the work of these sections regarding the provision and maintenance of temporary heat, ventilation, cooling and humidity control necessary prior to and subsequent to installation.
    h. Obtain requirements from sub-contractor with regard to the provision of temporary heat, ventilation, cooling and humidity control for the installation and protection of their work and submit report to Architect and the Owner’s Representative regarding provision of temporary heat, ventilation, cooling and humidity control and requirements of the Architect approved Construction Schedule.
    i. Cooperate with other sub-contractor with regard to the provision of temporary heat, ventilation, cooling and humidity control required for the installation and protection of their work.
    j. Coordinate with the Contractor regarding the construction schedule to assure provision of required heating, ventilation, cooling and humidity control as needed for the progress of the construction.

k. Do not hinder scheduled construction activities, which require specific environmental control. The Contractor shall bear the costs for delays resulting from the failure to provide adequate temporary heat, ventilation, cooling and humidity control as required by the Architect approved construction schedule.
l. Portable heaters will not be acceptable during final finishing operations.

3. If the contractor provides temp heat with LP gas heaters, a full and complete plan of installation must be provided and approved by the local Fire Marshall and other authorities having jurisdiction at least one month prior to the date system is needed to go on line. Heating plan will comply with all codes for installation and operation. The contractor will be responsible to provide all standby personnel during the installation and operation the system. This includes trades from other jurisdictions if applicable. The contractor will be responsible for dismantling and removal (off site) of the system in entirety.

4. It is the intent of the temporary heating, air conditioning and humidity control systems to condition the construction space (area) to receive all flooring and other specialty construction materials that require specific temperature, humidity conditions or pH levels, prior, during or after the installation of the item.

   a. Refer to Divisions 06 – 14 and 31-33 for project condition requirements.

5. The responsibility of the General Contractor for the provision of temporary heat subsequent to the enclosures of the building, buildings, or portions thereof shall be within the contract price, the total cost of which must be included and made a part of the lump sum bid submitted by each HVAC bidder.

G. Electric Power Service: Electrical Contractor shall provide Temporary Electric Power Service. Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnecting means, automatic ground-fault interrupters, and main distribution switchgear.

1. Install electric power service underground, unless overhead service must be used. Secure Architect's and Owner's approval of overhead service prior to installation.
2. Install power distribution wiring overhead and rise vertically where least exposed to damage.
3. Connect temporary service as directed by electric company officials.
4. Provide electric power without interruption on a 24 hour/7 day basis throughout the course of construction.
5. Install a temporary 400 amp single phase 120/240 volt electric service. Temporary service will be from poles by PPL. The temporary meter pole must be within 80 ft. of designated pole. This panel shall be used to power temporary lighting and outlets. All cabling and poles required to run temporary service to the trailers is the responsibility of the EC.

   a. Power provided shall be sufficient to allow all contracts to work without interruption due to issues with electrical service and quality of power provided.
   b. Any Contractor needing additional electrical service or three-phase service shall provide and pay for these services at his own expense.

H. Electric Distribution: Electrical Contractor shall provide Temporary Electric Distribution. Provide receptacle outlets adequate for connection of power tools and equipment.

1. Provide waterproof connectors to connect separate lengths of electrical power cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
2. Provide warning signs at power outlets other than 110 to 120 V.
3. Provide metal conduit, tubing, or metallic cable for wiring exposed to possible damage. Provide rigid steel conduits for wiring exposed on grades, floors, decks, or other traffic areas.
4. Provide metal conduit enclosures or boxes for wiring devices.
5. Provide 4-gang outlets, spaced so 100-foot extension cord can reach each area for power hand tools and task lighting. Provide a separate 125-V ac, 20-A circuit for each outlet.

I. Lighting: Electrical Contractor shall provide Temporary Lighting. At all enclosed spaces, provide temporary lighting with local switching that provides adequate illumination for construction operations and conditions.

1. Provide temporary lighting in all space to a minimum of 20 foot candles and as follows, unless otherwise indicated..
2. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
3. Provide one 100-W incandescent lamp per 500 sq. ft., uniformly distributed, for general lighting, or equivalent illumination.
4. Provide one 100-W incandescent lamp per story in stairways and ladder runs, located to illuminate each landing and flight.
5. Install exterior-yard site lighting that will provide adequate illumination for construction operations, traffic conditions, and signage visibility when the Work is being performed. Provide security lighting for the exterior yard.
6. Install lighting for Project identification sign.
7. In areas where finishes are being installed, lighting levels shall be provided that are equivalent to finished lighting levels.
8. The Contractor is further responsible for any additional lighting in excess of above if needed to perform the work properly.

J. Telephone Service: Each Contractor shall provide telephone service throughout construction period.

1. Telephone service must be maintained for project access and first-aid stations.
2. Each Prime Contractor shall post a list of important telephone numbers in their job trailer for the following.

    a. Police and fire departments.
    b. Ambulance service.
    c. Contractor's home office.
    d. Contractor’s emergency after-hours telephone number.
    e. Architect's office.
    f. Engineers' offices.
    g. Owner's office.
    h. Principal subcontractor' field and home offices.

3. Provide voice-mail on superintendent's telephone.
4. A cellular telephone for making and receiving telephone calls must be provided for each project superintendent, project manager and foreman, with access to e-mail and voice-mail.

K. Electronic Communication Service: The General Contractor shall provide computer connection in the primary field office adequate for use by Architect and Owner’s Representative to access Project electronic documents and maintain electronic communications.

1. The General Contractor shall provide internet service for the Owner, Architect and the Prime Contractors managers on site. Use charges for the highest speed connection available shall be in service for the entirety of the project. Usage shall include:

    a. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall, providing minimum 384 Kbps upload and 6 Mbps download speeds at each computer.
    b. Secure Wi-Fi wireless router sized to handle up to 30 devices.

        1) Each Contractor/Owner’s Representative/Architect shall be provided with the log on information.

    c. Provide service to maintain system regularly. Respond to reported problems with the system within 24 hours.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access within the construction limits for each phase of construction. Construction staging areas shall not interfere with construction activities nor Owner's adjacent activities, including but not limited to the Owner's use of the existing adjacent buildings, fields, parking, and safe egress from Owner occupied areas of the shared site. Coordinate locations with Architect and the Owner's Representative.
2. Provide incombustible construction for offices, shops, and sheds located within construction area or within 30 feet of building lines. Comply with NFPA 241.
3. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Site and Athletic Contractor shall maintain temporary roads and paved areas in condition to adequately support loads and withstand exposure to traffic during construction period. Locate temporary roads and paved areas in same location as permanent roads and paved areas. Extend temporary roads and paved areas, within construction limits indicated, as necessary for construction operations. Review proposed modifications to permanent paving with the Architect

1. Extend temporary paving in and around the construction area as necessary to accommodate delivery and storage of materials, equipment usage, administration, and supervision.
2. Coordinate elevations of temporary roads and paved areas with permanent roads and paved areas.
3. Coordinate temporary paving development with subgrade grading, compaction, installation and stabilization of subbase, and installation of base and finish courses of permanent paving.
4. Prepare subgrade and install subbase and base for temporary roads and paved areas according to Section 31 20 00 "Earth Moving."
5. Install temporary paving to minimize the need to rework the installations and result in permanent roads and paved areas without damage or deterioration when occupied by the Owner.
6. Recondition base after temporary use, including removing contaminated material, regrading, proof-rolling, compacting, and testing.
7. Delay installation of final course of permanent hot-mix asphalt pavement until immediately before Substantial Completion. Repair hot-mix asphalt base-course pavement before installation of final course according to Section 32 12 16 "Asphalt Paving."
8. Provide dust-control treatment that is non-polluting and non-tracking. Re-apply treatment as required to minimize dust.

C. Traffic Controls: Site and Athletics Contractor shall provide temporary traffic controls. Provide temporary traffic controls at junction of temporary roads with public access routes and adjacent properties. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.

1. Protect adjacent site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Coordinate with Owner to provide temporary parking areas for construction personnel.

E. De-watering Facilities and Drains: Site and Athletics Contractor shall provide dewatering facilities and drains. Comply with requirements of authorities having jurisdiction along with Section 31 25 00 "Sedimentation and Erosion Control Systems". Maintain Project site, excavations, and construction free of water.

1. Comply with regulations and responsibilities defined by the Erosion and Sedimentation Pollution Control permit. Fines associated with violations of permit shall be paid by the Contractor, and shall be at no cost to Owner.
2. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
3. Before connection and operation of permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.
4. Remove snow and ice as required to minimize accumulations.

F. Project Identification and Temporary Signs: Prepare Project Identification and other signs in sizes indicated. Install signs where indicated to inform public and persons seeking entrance to Project. Do not permit installation of unauthorized signs. Refer to Construction Sign requirements in the Project Drawings.

1. Provide, install, and maintain Project Identification Sign identifying at a minimum the Project Name, the Owner, Architect, Engineers, and Contractor. Review configuration, construction, layout and location with the Architect before fabrication and installation. Provide sign to be 4-feet by 8-feet, unless otherwise indicated.
2. Engage an experienced sign painter to apply graphics for Project identification signs. Comply with details indicated.
3. Provide, install, and maintain temporary signs to provide directional information to construction personnel and visitors.
4. Unless otherwise indicated, construct signs of exterior-type Grade B-B high-density concrete form overlay plywood in sizes and thickness required or indicated. Support on posts or framing of preservative-treated wood or steel.
5. Paint sign panel and applied graphics with exterior-grade alkyd gloss enamel over exterior primer.

G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste. Comply with Section 01 73 03 "Execution Requirements" and Section 01 74 19 “Construction Waste Management and Disposal” for progress cleaning requirements.

1. Each Prime Contractor shall collect waste created by the activities from construction areas and elsewhere daily.
2. The General Contractor is responsible for coordination with other prime contractors to maintain site and meeting the obligations for cleanup of individual work. The General Contractor is responsible for the overall condition of the Project Site.
3. If required by authorities having jurisdiction, provide separate containers, clearly labeled, for each type of waste material to be deposited.
4. Comply with requirements of NFPA 241 for removal of combustible waste material and debris. Enforce requirements strictly. Do not hold materials more than 7 days during normal weather or 3 days when the temperature is expected to rise above 80 deg F . Handle hazardous, dangerous, or unsanitary waste materials separately from other waste by containerizing properly. Dispose of material lawfully.
5. After floor slabs have been poured, maintain in a broom clean condition for remainder of project.
6. Clean existing paved roadways, drives and paving areas daily of construction debris, dirt and mud.
7. Clean site area outside of construction fences daily of wind blown wrappers, papers and other construction debris.

H. Janitorial Services: Each Prime Contractor shall provide Temporary Janitorial Services for temporary offices. General Contractor shall provide janitorial services on a daily basis for first-aid stations, toilets, wash facilities, and similar areas.

I. Storage and Fabrication Sheds: Each Prime Contractor shall provide Storage and Fabrication Sheds. Provide sheds sized, furnished, and equipped to accommodate materials and equipment involved, including temporary utility services. Sheds may be open shelters or fully enclosed spaces within building or elsewhere on-site.

1. Construct framing, sheathing, and siding using fire-retardant-treated lumber and plywood.
2. Paint exposed lumber and plywood with exterior-grade acrylic-latex emulsion over exterior primer.

J. Lifts and Hoists: Each Prime Contractor shall provide facilities necessary for hoisting materials and personnel.

1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

K. Temporary Elevator Use: Use of elevator is not permitted.

L. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate. Provide a temporary stair in accordance with OSHA guidelines at one of the stair towers in the construction area.

M. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

N. Other Construction Aids: Provide construction aids and miscellaneous facilities, such as scaffolds, platforms, swing stages, ramps and bridges, incidental sheeting and shoring, and demolition waste chutes to suit project conditions.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Site and Athletics Contractor shall provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects. Avoid using tools and equipment that produce harmful noise. Restrict use of noisemaking tools and equipment to hours that will minimize complaints from persons or firms near Project Site.

1. Comply with work restrictions specified in Section 01 10 00 “Summary”.

C. Storm Water Control: Site and Athletics Contractor shall provide storm water control facilities. Comply with the approved plans and requirements as well as on-site direction from authorities having jurisdiction. Provide earthen embankments and similar barriers in and around excavations and sub-grade construction, sufficient to prevent flooding by runoff of storm water from heavy rains.

D. Temporary Erosion and Sedimentation Control: Site and Athletics Contractor shall comply with the approved plans and requirements as well as on-site direction from authorities having jurisdiction. Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways.

1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from the project site during the course of the project.
4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

E. Snow Removal: Site and Athletics Contractor shall provide snow removal services. Remove snow from temporary and permanent access road, construction trailers and from construction work areas as necessary to not delay construction operation.

F. Tree and Plant Protection: Site and Athletics Contractor shall install temporary fencing located as indicated or outside the drip line of trees to remain to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.

G. Shoring and Bracing: Site and Athletics Contractor shall provide temporary shoring and bracing. Provide temporary shoring and bracing for completed or partially completed construction as may be required due to contractor method of construction, type of construction or site conditions as specified in Division 31.

H. Pest Control: General Contractor shall provide Temporary Pest Control. Before deep foundation work has been completed, retain a local exterminator or pest-control company to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests. Engage this pest-control service to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues

at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials.

I. Site Enclosure Fence: Before construction operations begin, Site and Athletics Contractor shall install chain-link enclosure fence with lockable entrance gates. Locate to enclose the entire construction site. Review location with Architect, Owner and Owner's Representative.

1. Enclose the project site to accommodate construction operations to include areas of storage, staging and parking. Install in a manner that will prevent general public, dogs, and other animals from easily entering site except by entrance gates.
2. Provide open mesh, chain link fencing at least 96 inches in height.
3. Set fence posts in compacted mixture of gravel and earth or concrete blocks.
4. Verify location of fence with Architect, Owner and Owner's Representative prior to installation.
5. Provide gates in sizes and at locations necessary to accommodate delivery vehicles.
6. Maintain security by limiting number of keys and restricting distribution to authorized personnel. Provide Owner with two sets of keys.
7. The Contractor for the General Construction shall be responsible for maintenance of the Construction Fence throughout the Project.

J. Temporary Egress: Maintain temporary egress as required by authorities having jurisdiction.

K. Security Enclosure and Lockup: Site and Athletics Contractor shall install substantial temporary enclosure around areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, the General contractor shall provide a secure lockup. The General Contractor shall enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
2. The Contractor for the General Construction shall open and secure all construction areas, gates, windows and hatches at the start and close of each work day.
3. The Owner assumes no risk or obligations for the Contractor's failure to secure or protect the Project Site throughout the course of construction.

L. Barricades, Warning Signs, and Lights: General Contractor shall provide Temporary Barricades, Warning Signs, and Lights. Comply with standards and code requirements for erecting structurally adequate barricades. Paint with appropriate colors, graphics, and warning signs to inform personnel and public of possible hazard. Where appropriate and needed, provide lighting, including flashing red or amber lights.

1. For safety barriers, and similar uses, provide minimum 5/8-inch- thick exterior plywood.

M. Temporary Enclosures: Each Prime Contractor is responsible to provide temporary enclosure for their respective work. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior.

1. Where heating or cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
2. Install temporary enclosures before time frames stated above when necessary to maintain interior relative humidity levels and temperatures as required to promote drying of concrete and concrete masonry substrates so that they achieve low enough moisture content and vapor emission levels to permit timely installation of finishes.
3. Vertical Openings: Close openings of 25 sq. ft. or less with plywood or similar materials and 6" batts of insulation.
4. Closure assemblies shall prevent moisture penetration.
5. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load-bearing, wood-framed construction.
6. Install tarpaulins securely using fire-retardant-treated wood framing and other materials.

7. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire-retardant-treated material for framing and main sheathing.

N. Temporary Partitions: General Contractor shall provide floor-to-deck dustproof partitions to limit dust and dirt migration into portions of building which are substantially complete to accommodate contractor's staging plans.

1. Construct dustproof partitions with gypsum wallboard with joints taped on occupied side, and fire-retardant plywood on construction operations side.

   a. Construct vestibule and airlock at each entrance through temporary partition with not less than 48 inches (1219 mm) between doors. Maintain water-dampened foot mats in vestibule.

2. Seal joints and perimeter. Provide gasketed dust-proof doors where openings are required.
3. Protect air-handling equipment.
4. Provide walk-off mats at each entrance through temporary partition.
5. Weatherstrip exterior openings.

O. Temporary Fire Protection: General Contractor shall provide temporary fire protection. Until fire-protection needs are supplied by permanent facilities, install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10, "Standard for Portable Fire Extinguishers," and NFPA 241, "Standard for Safeguarding Construction, Alterations, and Demolition Operations."

1. Provide fire extinguishers, installed on walls on mounting brackets, visible and accessible from space being served, with sign mounted above.

   a. Field Offices & Other Locations: Class ABC dry-chemical extinguishers or a combination of extinguishers of NFPA-recommended classes for exposures.
   b. Locate fire extinguishers where convenient and effective for their intended purpose; provide not less than one extinguisher on each floor at or near each usable stairwell.

2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire-protection facilities, stairways, and other access routes for firefighting.
4. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition.
5. Develop and supervise an overall fire-prevention and first-aid fire-protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
6. Prohibit smoking on Project Site.

   a. School property is Smoke Free Zone.

7. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire-protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

3.5 MOISTURE AND MOLD CONTROL

A. Contractor's Moisture-Protection Plan: Each Prime Contractor shall avoid trapping water in their own respective finished work. Document visible signs of mold that may appear during construction.

1. Should mold mitigation efforts be required by the Lancaster County Dept. of Health and testing is required, that the Contractor is responsible for the cost of said mitigation, testing, future inspections or any imposed fees or fines.

B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure to airborne mold spores, protect as follows:

1. Protect porous materials from water damage.
2. Protect stored and installed material from flowing or standing water.
3. Keep porous and organic materials from coming into prolonged contact with concrete.
4. Remove standing water from decks.
5. Keep deck openings covered or dammed.

C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:

1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
2. Keep interior spaces reasonably clean and protected from water damage.
3. Periodically collect and remove waste containing cellulose or other organic matter.
4. Discard or replace water-damaged material.
5. Do not install material that is wet.
6. Discard, replace or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use of permanent HVAC system to control humidity is prohibited.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.

    a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for forty-eight (48) hours shall be considered defective.
    b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record daily readings over a forty-eight hour period. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
    c. Remove materials that can not be completely restored to their manufactured moisture level within forty-eight (48) hours.

3.6 TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. All temporary facilities required for construction shall be uninterrupted, supplied and available on a 24 hour a day basis, seven days a week, regardless of scheduled construction activities.
3. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Temporary Facility Changeover: Except for use of permanent fire protection, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Unless the Architect requests that it be maintained longer, remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent

construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. Owner reserves right to take possession of Project identification signs.
2. Remove temporary paving not intended for or acceptable for integration into permanent paving. Where the area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil in the area. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at the temporary entrances, as required by the governing authority.
3. At Substantial Completion of each Phase, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Section 01 77 00 "Closeout Procedures."

    a. The Contractor shall replace air filters and clean equipment and inside of ductwork and housings.
    b. The Contractor shall replace significantly worn parts and parts subject to unusual operating conditions.
    c. The Contractor shall replace lamps burned out or noticeably dimmed by hours of use.

3.7 OPERATION OF EQUIPMENT:

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
2. Prevent water-filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. Temporary Facility Changeover: Except for using permanent fire protection as soon as available, do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.

D. Termination and Removal: Remove each temporary facility, other than Staging Area facilities, when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or upon issuance of Architect’s Certificate of Substantial Completion. Removal of temporary facilities in the Staging area shall occur no later than Final Completion unless authorized by the Owner. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of the Contractor. Owner reserves right to take possession of Project identification sign.
2. At Substantial Completion, clean and renovate permanent facilities used during construction period. Comply with final cleaning requirements in Division 1 Section “Closeout Procedures.”

E. Clean all systems and equipment prior to initial operation for testing, balancing, or other purposes. Lubricate, adjust, and test all equipment in accordance with manufacturer's instructions. Do not operate equipment unless all proper safety devices or controls are operational. Provide all maintenance and service for equipment that is authorized for operation during construction.

F. Provide the services of the manufacturer's factory-trained servicemen or technicians to start up the equipment.

G. Do not use mechanical systems for temporary services during construction unless authorized in writing by the Owner. Where such authorization is granted, temporary use of equipment shall in no way limit or otherwise affect warranties or guaranty period of the work. All equipment safeties shall be functional and equipment operated within the recommended and designed parameters.

H. Upon completion of work, clean and restore all equipment to new conditions; replace expendable items such as filters, blowdown all strainers, etc.

I. If the mechanical systems are used at any time without written authorization from the Owner, other than for initial factory start-up and/or testing, balancing, and commissioning, all equipment and duct systems shall be thoroughly cleaned by this Contractor (i.e., coils, fans, variable speed drives, heat wheels, terminal units, split systems, supply, return and exhaust ducts, etc.) to restore the system and equipment to like-new condition. If the Owner authorizes equipment start-up for temporary conditioning purpose, the Contractor shall utilize 100% outside air, provide filters as specified, insure all safeties/controls are functional, operate the equipment within the specified control sequence set points and manufacturer's recommendations; and protect all equipment from dust, dirt, debris, etc.. The Contractor is responsible for all internal and external cleaning to restore systems and equipment to like-new conditions.

3.8 FILTERS

A. Provide one (1) set of clean filters for balancing. One (1) complete set of additional filters shall be turned over to the Owner upon final acceptance of the building by the Owner. Provide correspondence documenting that additional filters have been turned over to the Owner.

B. All air handling unit pre-filters shall be 2" thick, 30% efficient (MERV 8), Camfil Farr 30/30, or as approved equal. All final filters shall be 12 thick, 65% efficient (MERV 13), Camfil Farr HP-P65 with Media Retainer Assembly, or as approved equal. Where final filters are indicated to be 4" thick, provide 65% efficient (MERV13) Camfil Farr Opti-Pac.

C. Provide MERV 13 filters for all intakes (return air grilles, outside air louvers, all AHU and terminal unit filters, etc.), if for any reason (start-up, testing and balancing, commissioning, etc.) the units are started prior to final building cleaning.

D. Provide one (1) differential pressure gauge across each filter bank. Differential pressure gauge shall be diaphragm activated, dial type, +/-2% accuracy of full scale, static pressure tips, aluminum tubing, vent valves, etc. Differential pressure gauge shall be Series 2000 magnahelic with air filter kit as manufactured by Dwyer or equal.

END OF SECTION 01 50 00

SECTION 01 56 39 - TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Section 015000 "Temporary Facilities and Controls" for temporary site fencing.
2. Section 311000 "Site Clearing" for removing existing trees and shrubs.

1.3 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inches above the ground for trees up to, and including, 4-inch size; and 12 inches above the ground for trees larger than 4-inch size.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: For each type of the following:

1. Organic Mulch: 1-pint volume of organic mulch; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch.
2. Protection-Zone Fencing: Assembled Samples of manufacturer's standard size made from full-size components.
3. Protection-Zone Signage: Full-size Samples of each size and text, ready for installation.

C. Tree Pruning Schedule: Written schedule detailing scope and extent of pruning of trees to remain that interfere with or are affected by construction.

1. Species and size of tree.
2. Location on site plan. Include unique identifier for each.
3. Reason for pruning.
4. Description of pruning to be performed.
5. Description of maintenance following pruning.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified arborist and tree service firm.

B. Certification: From arborist, certifying that trees indicated to remain have been protected during construction according to recognized standards and that trees were promptly and properly treated and repaired when damaged.

C. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

D. Existing Conditions: Documentation of existing trees and plantings indicated to remain, which establishes preconstruction conditions that might be misconstrued as damage caused by construction activities.

1. Use sufficiently detailed photographs or videotape.
2. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plants designated to remain.

1.6 QUALITY ASSURANCE

A. Arborist Qualifications: Certified Arborist as certified by ISA.

B. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project and that will assign an experienced, qualified arborist to Project site during execution of the Work.

C. Preinstallation Conference: Conduct conference at Project site.

1. Review methods and procedures related to temporary tree and plant protection including, but not limited to, the following:

a. Construction schedule. Verify availability of materials, personnel, and equipment needed to make progress and avoid delays.
b. Enforcing requirements for protection zones.
c. Arborist's responsibilities.
d. Field quality control.

1.7 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Stockpile topsoil as needed away from existing tree canopies.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood.
2. Size Range: 3 inches maximum, 1/2 inch minimum.
3. Color: Natural.

C. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft.; remaining flexible from minus 60 to plus 200 deg F; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart.

a. Height: 4 feet.
b. Color: High-visibility orange, nonfading.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Tie a 1-inch blue-vinyl tape around each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated.

1. Apply 4-inch average thickness of organic mulch. Do not place mulch within 6 inches of tree trunks.

3.3 TREE- AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people and animals from easily entering protected area. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.

B. Maintain protection zones free of weeds and trash.

C. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

D. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Section 312000 "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Coat cut ends of roots more than 1-1/2 inches in diameter with a coating formulated for use on damaged plant tissues and that is acceptable to arborist.
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Section 312000 "Earth Moving."

3.6 CROWN PRUNING

A. Prune branches that are affected by temporary and permanent construction. Prune branches as follows:

1. Prune trees to remain to compensate for root loss caused by damaging or cutting root system. Provide subsequent maintenance during Contract period as recommended by arborist.

B. Chip removed branches and dispose of off-site.

3.7 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.8 FIELD QUALITY CONTROL

A. Inspections: Engage a qualified arborist to direct plant-protection measures in the vicinity of trees, shrubs, and other vegetation indicated to remain and to prepare inspection reports.

3.9 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed root cutting and tree and shrub repairs.
2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
4. Perform repairs within 24 hours.
5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 25 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Provide new trees of same size and species as those being replaced for each tree that measures 6 inches or smaller in caliper size.

2. Plant and maintain new trees as specified in Section 329300 "Plants."

C. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.10 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 01 56 39

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

B. Related Sections:

1. Division 01 Section "Allowances" for products selected under an alternate.
2. Division 01 Section "Alternates" for products selected under an alternate.
3. Division 01 Section "Substitution Procedures" for requests for substitutions.
4. Division 01 Section "References" for applicable industry standards for products specified.
5. Division 01 Section “Submittal Procedures” for submission of shop drawings, product data, samples and other submittals.
6. Division 01 Section “Closeout Procedures” for submitting warranties for Contract closeout.
7. Division 02 Section through 33 Sections for specific requirements for warranties on products and installations specified to be warranted.

1.3 DEFINITIONS

A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.

B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.

C. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within ten (10) days of receipt of request, or five (5) days of receipt of additional information or documentation, whichever is later.

a. Form of Approval: As specified in Division 01 Section "Submittal Procedures."
b. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.

B. Basis-of-Design Product Specification Submittal: Comply with requirements in Division 01 Section "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1. Each contractor is responsible for providing products and construction methods compatible with products and construction methods of other contractors.
2. If a dispute arises between contractors over concurrently selectable but incompatible products, Architect will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.

5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.
7. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. Refer to Divisions 02 through 33. Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

D. The warranty period on systems or equipment shall begin at date of Substantial Completion in part or whole. Contractor shall make provisions as required to extend the manufacturer’s warranty from time of initial operation of systems or equipment until Substantial Completion is given in writing.

E. The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
4. Where products are accompanied by the term "as selected," Architect will make selection.
5. Where products are accompanied by the term “match sample” Architect will make selection.
6. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.

7. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.

B. Product Selection Procedures:

1. Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered, following bidding unless addressed by Division 01, Section “Substitution Procedures”.
2. Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
3. Products:

    a. Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements.

4. Manufacturers:

    a. Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements.

5. Available Products: Where Specifications include a list of names of both products and manufacturers, provide one of the products listed, or an unnamed product, that complies with requirements. Comply with provisions in Part 2 “Comparable Products” Article for consideration of an unnamed product.
6. Available Manufacturers: Where Specifications include a list of manufacturers, provide a product by one of the manufacturer’s listed, or an unnamed manufacturer, that complies with requirements. Comply with provisions in Part 2 “Comparable Products” Article for consideration of an unnamed product.
7. Product Options: Where Specifications indicate that sizes, profiles, and dimensional requirements on Drawings are based on a specific product or system, provide the specified product or system. Comply with provisions in Part 2 “Product Substitutions” Article for consideration of an unnamed product or system.
8. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.

1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.

D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

A. Conditions for Consideration: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

1. Evidence that the proposed product does not require revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 – EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Construction layout.
2. Field engineering and surveying.
3. Installation of the Work.
4. Cutting and patching.
5. Coordination of Owner-installed products.
6. Progress cleaning.
7. Starting and adjusting.
8. Protection of installed construction.
9. Correction of the Work.

B. Related Sections:

1. Division 01 Section “Summary” for limits on use of project site.
2. Division 01 Section “Project Management and Coordination” for procedures for coordinating field engineering with other construction activities.
3. Division 01 Section "Submittal Procedures" for submitting surveys.
4. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
5. Division 02 Section "Selective Structure Demolition" for demolition and removal of selected portions of the building.
6. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

A. Qualification Data: For land surveyor.

B. Certificates: Submit certificate signed by land surveyor or professional engineer certifying that location and elevation of improvements comply with requirements.

C. Cutting and Patching Plan: Submit plan describing procedures at least ten (10) days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate how long services and systems will be disrupted.

    a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.

6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.
7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

D. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal.

E. Certified Surveys: Submit four (4) copies signed by land surveyor or professional engineer. In addition, provide electronic pdf file.

1. Owner will provide existing property survey and identify benchmarks, control points and property corners.

F. Final Property Survey: Submit four (4) copies showing the Work performed and record survey data. In addition, provide electronic pdf and ACAD files.

1.5 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from the Architect before proceeding. Shore, brace, and support structural element during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include but are not limited to the following:

    a. Primary operational systems and equipment.

b. Fire separation assemblies.
c. Air or smoke barriers.
d. Fire-suppression systems.
e. Mechanical systems piping and ducts.
f. Control systems.
g. Communication systems.
h. Conveying systems.
i. Electrical wiring systems.
j. Operating systems of special construction.
k. Life Safety Systems.
l. Security Systems.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

a. Water, moisture, or vapor barriers.
b. Membranes and flashings.
c. Exterior curtain-wall construction.
d. Equipment supports.
e. Piping, ductwork, vessels, and equipment.
f. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

C. Cutting and Patching Conference: Before proceeding, meet at Project Site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, utilize products for patching that comply with requirements of Division 01 Section "Sustainable Design Requirements."

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to the Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.

1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

B. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

1. Before construction, verify the location and points of connection of utility services.

C. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.

1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

D. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:

a. Description of the Work.
b. List of detrimental conditions, including substrates.
c. List of unacceptable installation tolerances.
d. Recommended corrections.

2. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
3. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
4. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
5. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. Each Prime Contractor is responsible for their own cutting and patching.

B. Temporary: Provide temporary support of Work to be cut.

C. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

D. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas

E. Existing Utility Information: Furnish information to local utility that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

F. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

G. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

H. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect according to requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect promptly.

B. General: General Contractor shall engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.

1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
2. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
3. Inform installers of lines and levels to which they must comply.
4. Check the location, level and plumb, of every major element as the Work progresses.
5. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
6. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.

C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

1. Verify alignment of existing finished floor elevations with new construction.

E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each

survey party member, and types of instruments and tapes used. Make the log available for reference by Architect and Owner.

3.4 FIELD ENGINEERING

A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.

1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.

B. Benchmarks: Establish and maintain a minimum of two (2) permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.

1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.

1. Make vertical work plumb and make horizontal work level.
2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
4. Maintain minimum headroom clearance of 108 inches in occupied spaces and 92 inches in unoccupied spaces.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.

E. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.

1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
2. Allow for building movement, including thermal expansion and contraction.
3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Each Prime Contractor is responsible for all cutting and patching required for operations and installations within their respective scope(s) of work.
2. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas.

F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.

3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
6. Proceed with patching after construction operations requiring cutting are complete.

G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.

    a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    b. Restore damaged pipe covering to its original condition.

3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.

    a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.

H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

A. Site Access: Provide access to Project site for Owner's construction personnel.

B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's construction personnel.

1. Construction Schedule: Coordinate construction schedule for Owner's portion of the Work. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
2. Preinstallation Conferences: Include Owner's construction personnel and Owner’s Representative at preinstallation conferences covering portions of the Work that are to receive Owner's work. Attend preinstallation conferences conducted by Owner's construction personnel if portions of the Work depend on Owner's construction.

3.8 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.

    a. Utilize containers intended for holding waste materials of type to be stored.

4. Coordinate progress cleaning for joint-use areas where more than one installer has worked.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls" and Division 01 Section "Construction Waste Management and Disposal"

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 01 91 13 “General Commissioning Requirements”.

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

E. Manufacturer's Field Service: Comply with qualification requirements in Division 01 Section "Quality Requirements."

3.10 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

A. Repair or remove and replace defective construction. Restore damaged substrates and finishes.

1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.

B. Restore permanent facilities used during construction to their specified condition.

C. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

D. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

E. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Salvaging nonhazardous demolition and construction waste.
2. Recycling nonhazardous demolition and construction waste.
3. Disposing of nonhazardous demolition and construction waste.

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.

F. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.

1.4 INFORMATIONAL SUBMITTALS

A. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Burning: Burning of waste materials is permitted only at designated areas on Owner's property, provided required permits are obtained. Provide full-time monitoring for burning materials until fires are extinguished.

D. Disposal: Transport waste materials and dispose of at designated spoil areas on Owner's property.

E. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION 01 74 19

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Hazardous-free materials certification.

B. Related Sections:

1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial and Final Completion.
2. Division 01 Section “Temporary Facilities and Controls” for progress and final cleaning.
3. Division 01 Section "Execution" for progress cleaning of Project site.
4. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
6. Division 01 Section "Demonstration and Training" for requirements for instructing Owner's personnel.
7. Divisions 02 through 33 Sections for specific closeout and special cleaning requirements for the Work in those Sections.

1.3 CLOSEOUT PROCEDURES

A. Completion of the Work specified herein is a condition precedent to approval of the Final Payment by Owner.

B. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Owner review for acceptance.

C. Provide submittals to Owner required by individual specification sections, governing regulations or other authorities having jurisdiction.

D. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

1.4 FINAL CLEANING

A. Execute final cleaning prior to final project assessment and observation by Owner.

B. Clean area within contract limits including surfaces exposed to view; remove debris, stains and foreign substances, polish transparent and glossy surfaces.

C. Clean existing constructed elements, equipment and fixtures to condition prior to beginning Work with cleaning materials and methods appropriate to the surface and material being cleaned.

D. Clean new Work in accordance with Product manufacturer instructions and recommendations.

E. Provide additional cleaning as required within individual specification sections.

F. Remove waste and surplus materials, rubbish, and construction facilities. Dispose of in a legal manner.

1.5 ADJUSTING

A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.6 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete with request.

1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
2. Advise Owner of pending insurance changeover requirements.
3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
5. Prepare and submit Project Record Documents, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information.
6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
8. Complete startup testing of systems.
9. Submit test/adjust/balance records.
10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
11. Advise Owner of cleaning of existing equipment and utilities used during construction.
12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
13. Complete final cleaning requirements, including touchup painting.
14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.

B. Inspection: Submit a written request for inspection for Substantial Completion. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. Any costs for re-inspection(s) shall be the responsibility of the Contractor.
2. Results of completed inspection will form the basis of requirements for final completion.

1.7 FINAL COMPLETION

A. Preliminary Procedures: Before requesting final inspection for determining final completion, complete the following:

1. Submit a final Application for Payment according to Division 01 Section "Payment Procedures."
2. Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. The certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
4. Submit pest-control final inspection report and warranty.
5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training video recordings.

B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. Any costs for re-inspection(s) shall be the responsibility of the Contractor.

1.8 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction. Use CSI Form 14.1A.

1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
3. Include the following information at the top of each page:

    a. Project name.
    b. Date.
    c. Name of Architect.
    d. Name of Contractor.
    e. Page number.

4. Submit list of incomplete items in the following format:

    a. Submit in pdf file format.

1.9 WARRANTIES

A. Submittal Time: Submit written warranties on request of Architect for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.

1. Provide three (3) notarized copies.
2. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
3. Provide Table of Contents and assemble in three ring binder with durable plastic cover.
4. Submit prior to final Application for Payment.
5. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.

C. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.

1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Contractor.
4. Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide table of contents at beginning of document.

D. Provide additional copies of each warranty to be included in operation and maintenance manuals.

1.10 HAZARDOUS-FREE MATERIALS CERTIFICATION

A. Upon completion of project, Contractor shall deliver to the Owner three (3) copies of a notarized letter on Contractor’s letterhead addressed to the Owner certifying that to the best of the Contractor's knowledge all products provided for incorporation into this project do not contain any hazardous materials exceeding current EPA guidelines.

B. It is the responsibility of the Contractor to review "Manufacturer's Safety Data Sheets" (MSDS) on all products to ascertain compliance with EPA guidelines prior to shop drawing submission to the Owner. Incorporation of products into the project without the submission of shop drawings or samples to the Owner will indicate that the Contractor has ascertained that the products meet EPA limits.

C. It is the responsibility of the Contractor to notify the Owner in writing of the lack of compliance of a product with EPA guidelines prior to ordering or incorporating any products into this Project.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Spare Parts and Maintenance Materials: Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.

1. Deliver to Project site and place in location as directed. Furnish extra materials and parts as indicated within the respective specification sections. Obtain receipt from Owner upon delivery and placement and prior to final payment.

B. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

1. Use cleaning products that meet Green Seal GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

B. Cleaning: Employ professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions. Final cleaning shall be provided for each phase of construction prior to substantial completion.

1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for each portion of Project:

a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
d. Remove tools, construction equipment, machinery, and surplus material from Project site.
e. Remove snow and ice to provide safe access to building.
f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
h. Sweep concrete floors broom clean in unoccupied spaces.
i. Vacuum carpet and similar soft surfaces, removing debris and excess nap; shampoo if visible soil or stains remain.
j. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
k. Remove labels that are not permanent.
l. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

1) Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates.

m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
n. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter upon inspection.

1) Clean HVAC system in compliance with NADCA Standard 1992-01. Provide written report upon completion of cleaning.

r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy

starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

s. Leave Project clean and ready for occupancy.

C. Pest Control: Engage an experienced, licensed exterminator to make a final inspection and rid Project of rodents, insects, and other pests. Prepare a report.

D. Construction Waste Disposal: Comply with waste disposal requirements in Division 01 Section "Temporary Facilities and Controls" and Division 01 Section "Construction Waste Management and Disposal."

END OF SECTION 01 77 00

Knowledge for Creating and Sustaining the Built Environment

PUNCH LIST

Project: _____

_____

To (Contractor): _____

_____

From (A/E): _____

Site Visit Date: _____

A/E Project Number: _____

Contract For: _____

The following items require the attention of the Contractor for completion or correction. This list may not be all-inclusive, and the failure to include any items on this list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

Item Number	Room Number	Location (Area)	Description	Correction/Completion Date	Verification A/E Check

☐ Attachments

Signed by: Date:

Copies: ☐ Owner ☐ Consultants ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ _____ ☐ File

September 1996
CSI Form 14.1A

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and SUMMARY

A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:

1. Operation and maintenance documentation directory.
2. Emergency manuals.
3. Operation manuals for systems, subsystems, and equipment.
4. Product maintenance manuals.
5. Systems and equipment maintenance manuals.

B. Related Sections:

1. Division 01 Section "Summary of Multiple Contracts" for division of responsibilities for the Work.
2. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
3. Division 01 Section "Closeout Procedures" for submitting operation and maintenance manuals.
4. Division 01 Section "Project Record Documents" for preparing Record Drawings for operation and maintenance manuals.
5. Divisions 02 through 33 Sections for specific operation and maintenance manual requirements for the Work in those Sections.

1.3 DEFINITIONS

A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.

B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

A. Manual Content: Operations and maintenance manual content is specified in individual specification sections to be reviewed at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.

1. Where applicable, clarify and update reviewed manual content to correspond to modifications and field conditions.

B. Format: Submit operations and maintenance manuals in the following format:

1. PDF electronic file. Assemble each manual into a composite electronically-indexed file. Submit on digital media acceptable to Architect.

a. Name each indexed document file in composite electronic index with applicable item name. Include a complete electronically-linked operation and maintenance directory.
b. Enable inserted reviewer comments on draft submittals.

2. Two (2) paper copies. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves. Architect will return one (1) copy.

C. Initial Manual Submittal: Submit two (2) draft copies of each manual at least thirty 30 days before commencing demonstration and training. Include a complete operation and maintenance directory. Architect will comment on whether general scope and content of manual are acceptable.

D. Final Manual Submittal: Submit each manual in final form at least fifteen (15) days prior to requesting final inspection an Architect will return copy with comments within 21 days after final inspection.

1. Correct or modify each manual to comply with Architect's comments. Submit copies of each corrected manual within fifteen (15) days of receipt of Architect's comments.

1.5 COORDINATION

A. A. Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

A. Organization: Include a section in the directory for each of the following:

2. List of documents.
3. List of systems.
4. List of equipment.
5. Table of contents.

B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.

D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

A. Submit data on 8-1/2 x 11 inch text pages, bound in “D” side ring binder(s) with durable plastic covers.

B. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:

1. Title page.
2. Table of contents.
3. Manual contents.

B. Title Page: Include the following information:

1. Subject matter included in manual.
2. Name and address of Project.
3. Name and address of Owner.
4. Date of submittal.
5. Name and contact information for Contractor.
6. Name and contact information for Architect.
7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
8. Cross-reference to related systems in other operation and maintenance manuals.

C. Directory Page: listing names, addresses, and telephone numbers of Owner, Contractor, Subcontractors, and major equipment suppliers. Include for all mechanical and electrical equipment a compilation of the nameplate data for equipment; name, address and phone number of nearest distributor; name, address and phone number of nearest service organization.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.

1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

E. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.

F. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.

1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.
2. File Names and Bookmarks: Enable bookmarking of individual documents based upon file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel upon opening file.

F. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.

1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.

   a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
   b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.

2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.

3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.

    a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
    b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

2.3 EMERGENCY MANUALS

A. Content: Organize manual into a separate section for each of the following:

1. Type of emergency.
2. Emergency instructions.
3. Emergency procedures.

B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:

1. Fire.
2. Flood.
3. Gas leak.
4. Water leak.
5. Power failure.
6. Water outage.
7. System, subsystem, or equipment failure.
8. Chemical release or spill.

C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.

D. Emergency Procedures: Include the following, as applicable:

1. Instructions on stopping.
2. Shutdown instructions for each type of emergency.
3. Operating instructions for conditions outside normal operating limits.
4. Required sequences for electric or electronic systems.
5. Special operating instructions and procedures.

2.4 OPERATION MANUALS

A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:

1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
2. Performance and design criteria if Contractor is delegated design responsibility.
3. Operating standards.
4. Operating procedures.
5. Operating logs.
6. Wiring diagrams.
7. Control diagrams.
8. Piped system diagrams.
9. Precautions against improper use.

10. License requirements including inspection and renewal dates.

B. Descriptions: Include the following:

1. Product name and model number. Use designations for products indicated on Contract Documents.
2. Manufacturer's name.
3. Equipment identification with serial number of each component.
4. Equipment function.
5. Operating characteristics.
6. Limiting conditions.
7. Performance curves.
8. Engineering data and tests.
9. Complete nomenclature and number of replacement parts.

C. Operating Procedures: Include the following, as applicable:

1. Startup procedures.
2. Equipment or system break-in procedures.
3. Routine and normal operating instructions.
4. Regulation and control procedures.
5. Instructions on stopping.
6. Normal shutdown instructions.
7. Seasonal and weekend operating instructions.
8. Required sequences for electric or electronic systems.
9. Special operating instructions and procedures.

D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.

E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

2.5 PRODUCT MAINTENANCE MANUALS

A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.

B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Product Information: Include the following, as applicable:

1. Product name and model number.
2. Parts list for each component.
3. Manufacturer's name.
4. Color, pattern, and texture.
5. Material and chemical composition.
6. Reordering information for specially manufactured products.

D. Maintenance Procedures: Include manufacturer's written recommendations and the following:

1. Inspection procedures.
2. Types of cleaning agents to be used and methods of cleaning.
3. List of cleaning agents and methods of cleaning detrimental to product.
4. Schedule for routine cleaning and maintenance.
5. Repair instructions.

E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.

F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.

B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.

C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:

1. Standard maintenance instructions and bulletins.
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
3. Identification and nomenclature of parts and components.
4. List of items recommended to be stocked as spare parts.

D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:

1. Test and inspection instructions.
2. Troubleshooting guide.
3. Precautions against improper maintenance.
4. Maintenance instructions for equipment and systems.
5. Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
6. Disassembly; component removal, repair, and replacement; and reassembly instructions.
7. Aligning, adjusting, and checking instructions.
8. Demonstration and training video recording, if available.

E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.

1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.

F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.

G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.

H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.

1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

A. Submit 1 draft copy of completed volume(s) 15 days prior to final inspection. These copies will be reviewed and returned after final inspection, with Owner/Engineer comments. Revise content of all document sets as required prior to final submission.

B. Submit one (1) copy and electronic copy of revised final volumes, within 10 days after final inspection.

C. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.

B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.

C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.

D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.

E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.

1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.

F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.

1. Do not use original project record documents as part of operation and maintenance manuals.
2. Comply with requirements of newly prepared record Drawings in Division 01 Section "Project Record Documents."

G. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for project record documents, including the following:

1. Marked-up copies of Contract Drawings.
2. Marked-up copies of Shop Drawings.
3. Marked-up copies of Specifications, addenda, and Change Orders.
4. Marked-up Product Data submittals.
5. Record Samples.
6. Field records for variable and concealed conditions.
7. Record information on Work that is recorded only schematically.
8. Record Drawings, to include scanned digital format.
9. Record Specifications, to include scanned digital format.
10. Record product Data, to include scanned digital format.

B. Maintenance of Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition. Make documents and Samples available at all times for the Architect’s inspections.

C. Related Sections:

1. Division 01 Section “Summary of Multiple Contracts” for division of responsibilities for the Work.
2. Division 01 Section "Closeout Procedures" for general closeout procedures.
3. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.
4. Divisions 02 through 33 Sections for specific requirements for project record documents of the Work in those Sections.

1.3 CLOSEOUT SUBMITTALS

A. Record Drawings: Comply with the following:

1. Number of Copies: Submit copies of Record Drawings as follows:

a. Initial Submittal: Submit one paper copy set of marked-up record prints. Architect will indicate whether general scope of changes, additional information recorded, are inclusive. All revisions shall be highlighted in a bubble.
b. Final Submittal: Submit two paper copies set of marked-up record prints incorporating all project changes. In addition, provide electronic pdf file of record drawings. All revisions shall be highlighted in a bubble.

B. Record Specifications: Submit electronic pdf file of Project's Specifications, including addenda and contract modifications.

C. Operations and Maintenance (O&M) Data: Submit electronic pdf file of O&M data.

D. Record Product Data: Submit electronic pdf file of each submittal.

1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.

E. Miscellaneous Record Submittals: Refer to other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit electronic pdf file of each submittal.

F. Reports: Submit written report indicating items incorporated in Project record documents concurrent with progress of the Work, including modifications, concealed conditions, field changes, product selections, and other notations incorporated.

G. Store record documents separate from documents used for construction reference.

H. Record information within Record Documents concurrent with construction progress.

I. Submit documents to Architect with final Application for Payment. Failure to submit will result in withholding Application for Payment.

PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

A. Maintain on site, one set of Record Documents which shall include Contract Drawings, Specifications, Addenda, Change Orders and other Contract modification documents, reviewed Shop Drawings, Product Data, Samples, Manufacturer's instruction for assembly, installation, and adjusting.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.

a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
b. Accurately record information in an acceptable drawing technique.
c. Record data as soon as possible after obtaining it.
d. Record and check the markup before enclosing concealed installations.

2. Content: Types of items requiring marking include, but are not limited to, the following:

a. Field changes of dimension and detail.
b. Measure depths of foundations in relation to finish floor/grade.
c. Revisions to details shown on Drawings.
d. Depths of foundations below first floor.
e. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements within contract limit lines.
f. Revisions to routing of piping and conduits.
g. Revisions to electrical circuitry.
h. Actual equipment locations.
i. Duct size and routing.
j. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
k. Changes made by Change Order or Change Directive.
l. Changes made following Architect's written orders.
m. Details not on the original Contract Drawings.
n. Field records for variable and concealed conditions.
o. Record information on the Work that is shown only schematically.

3. Mark the Contract Drawings and Shop Drawings completely and accurately. Utilize personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.

1. Record Prints: Record Prints: Provide organized record Drawings on a flash drive in PDF file format.
2. Identification: As follows:

    a. Project name.
    b. Date.
    c. Designation "PROJECT RECORD DRAWINGS."
    d. Name of Architect.
    e. Name of Contractor.

2.2 RECORD SPECIFICATIONS

A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Legibly mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions, alternates utilized, changes made by addenda, modifications and product options selected.
3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
5. Note related Change Orders, record Product Data, and record Drawings where applicable.

2.3 RECORD PRODUCT DATA

A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.

1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
3. Note related Change Orders, record Specifications, and record Drawings where applicable.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and modifications to project record documents as they occur; do not wait until the end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours. Record drawings will be reviewed monthly with payment requests.

END OF SECTION 01 78 39

SECTION 01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training video recordings.

B. Related Sections:

1. Division 01 Section "Summary of Multiple Contracts" for division of responsibilities for the Work.
2. Division 01 Section "Project Management and Coordination" for requirements for pre-instruction conferences.
3. Divisions 02 through 33 Sections for specific requirements for demonstration and training for products in those Sections.

1.3 INFORMATIONAL SUBMITTALS

A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.

1. Indicate proposed training modules utilizing manufacturer-produced demonstration and training video recordings for systems, equipment, and products in lieu of video recording of live instructional module.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

1.4 CLOSEOUT SUBMITTALS

A. Demonstration and Training Video Recordings: Submit two (2) copies within seven (7) days of end of each training module.

1. Identification: On each copy, provide an applied label with the following information:

a. Name of Project.
b. Name and address of videographer.
c. Name of Architect.
d. Name of Contractor.
e. Date of video recording.
f. Description of vantage point, indicating location, direction (by compass point) and elevation or story of construction.

2. Transcript: Prepared on 8-1/2-by-11-inch (215-by-280-mm) paper, punched and bound in heavy-duty, three-ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.
3. At completion of training, submit three (3) complete training manuals for Owner's use.

1.5 QUALITY ASSURANCE

A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.

B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Division 01 Section "Quality Requirements," experienced in operation and maintenance procedures and training.

C. Videographer Qualifications: A professional videographer who is experienced photographing demonstration and training events similar to those required.

D. Pre-instruction Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to demonstration and training including, but not limited to, the following:

1. Inspect and discuss locations and other facilities required for instruction.
2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
3. Review required content of instruction.
4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.6 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Architect.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections.

1. Elevator.
2. Fire-protection systems, including fire alarm.
3. Intrusion detection systems.
4. Heat generation, including boilers, feedwater equipment, pumps, and water distribution piping.
5. Refrigeration systems, including chillers, condensers, pumps and distribution piping.

6. HVAC systems, including air-handling equipment, air distribution systems and terminal equipment and devices.
7. HVAC instrumentation and controls.
8. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies and motor controls.
9. Lighting equipment and controls.
10. Communication systems, including intercommunication, surveillance, clocks and programming, voice and data, and television equipment.

B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:

1. Basis of System Design, Operational Requirements, and Criteria: Include the following:

    a. System, subsystem, and equipment descriptions.
    b. Performance and design criteria if Contractor is delegated design responsibility.
    c. Operating standards.
    d. Regulatory requirements.
    e. Equipment function.
    f. Operating characteristics.
    g. Limiting conditions.
    h. Performance curves.

2. Documentation: Review the following items in detail:

    a. Emergency manuals.
    b. Operations manuals.
    c. Maintenance manuals.
    d. Project record documents.
    e. Identification systems.
    f. Warranties and bonds.
    g. Maintenance service agreements and similar continuing commitments.

3. Emergencies: Include the following, as applicable:

    a. Instructions on meaning of warnings, trouble indications, and error messages.
    b. Instructions on stopping.
    c. Shutdown instructions for each type of emergency.
    d. Operating instructions for conditions outside of normal operating limits.
    e. Sequences for electric or electronic systems.
    f. Special operating instructions and procedures.

4. Operations: Include the following, as applicable:

    a. Startup procedures.
    b. Equipment or system break-in procedures.
    c. Routine and normal operating instructions.
    d. Regulation and control procedures.
    e. Control sequences.
    f. Safety procedures.
    g. Instructions on stopping.
    h. Normal shutdown instructions.
    i. Operating procedures for emergencies.
    j. Operating procedures for system, subsystem, or equipment failure.
    k. Seasonal and weekend operating instructions.
    l. Required sequences for electric or electronic systems.
    m. Special operating instructions and procedures.

5. Adjustments: Include the following:

a. Alignments.
b. Checking adjustments.
c. Noise and vibration adjustments.
d. Economy and efficiency adjustments.

6. Troubleshooting: Include the following:

a. Diagnostic instructions.
b. Test and inspection procedures.

7. Maintenance: Include the following:

a. Inspection procedures.
b. Types of cleaning agents to be used and methods of cleaning.
c. List of cleaning agents and methods of cleaning detrimental to product.
d. Procedures for routine cleaning
e. Procedures for preventive maintenance.
f. Procedures for routine maintenance.
g. Instruction on use of special tools.

8. Repairs: Include the following:

a. Diagnosis instructions.
b. Repair instructions.
c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
d. Instructions for identifying parts and components.
e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements in Division 01 Section "Operations and Maintenance Data."

B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.

B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.

1. Architect / Engineer will describe basis of system design, operational requirements, criteria, and regulatory requirements.
2. Owner will furnish an instructor to describe Owner's operational philosophy.
3. Owner will furnish Contractor with names and positions of participants.

C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.

1. Schedule training with Owner, through Architect, with at least seven (7) days' advance notice.

D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a performance-based demonstration.

E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

A. General: Engage a qualified commercial videographer to record demonstration and training video recordings. Record each training module separately. Include classroom instructions and demonstrations, board diagrams, and other visual aids, but not student practice.

1. At beginning of each training module, record each chart containing learning objective and lesson outline.

B. Video Recording Format: Provide two (2) sets of high-quality color video recordings with menu navigation in format acceptable to Architect.

C. Recording: Mount camera on tripod before starting recording, unless otherwise necessary to show area of demonstration and training. Display continuous running time.

D. Narration: Describe scenes on video recording by audio narration by microphone while video recording is recorded. Include description of items being viewed.

E. Transcript: Provide a transcript of the narration. Display images and running time captured from videotape opposite the corresponding narration segment.

F. Pre-Produced Video Recordings: Provide two (2) copies of video recordings used as a component of training modules in same format as recordings of live training.

END OF SECTION 01 79 00

SECTION 01 91 00 – GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Commissioning is a systematic process of ensuring that all building systems perform interactively according to the owner's project requirements and operational needs. The commissioning process shall encompass and coordinate the traditionally separate functions of system documentation, equipment startup, control system calibration, testing and balancing, performance testing and training.

B. Commissioning during the construction phase is intended to achieve the following specific objectives according to the Contract Documents:

1. Verify that applicable equipment and systems are installed according to the manufacturer's recommendations and to industry accepted minimum standards and that they receive adequate operational checkout by installing contractors.
2. Verify and document proper performance of equipment and systems.

C. The commissioning process does not take away from or reduce the responsibility of the installing contractors to provide a finished and fully functioning product.

D. Related Sections:

1. Sections 21 08 00, 22 08 00, 23 08 00 and 26 08 00 for additional mechanical, fire protection, plumbing and electrical Commissioning requirements
2. Sections 01 97 00 (Closeout procedures), 01 78 00 (Closeout Submittals), and 01 98 00 (Demonstration and Training) for additional mechanical, plumbing and electrical closeout Commissioning requirements.

1.2 REFERENCES, RESOURCES

A. ASHRAE Guideline 0-2005: The Commissioning Process

B. ASHRAE Standard 202-2013: Commissioning Process for Buildings and Systems

C. ASHRAE Guideline 1.1: HVAC&R Technical Requirements for the Commissioning Process

D. Building Commissioning Association

E. AABC Commissioning Group

1.3 DEFINITIONS

A. Use of terms and abbreviations referring to the Building Automation and Automatic Temperature Controls (ATC) Contractor and the Testing and Balancing (TAB) Contractor shall be understood to mean the Subcontractors to the HVAC Contractor for these specific portions of the Work.

1.4 COORDINATION

A. Commissioning Team. The members of the commissioning team consist of the Commissioning authority (CxA), the Owner's Representative and Construction Advisor (PM), the General Contractor (GC or Contractor), the architect and design engineers (particularly the Mechanical and Electrical Engineers) (A/E), the HVAC Contractor (MC), the Plumbing Contractor (PC), Fire Protection Contractor (FPC), the Electrical Contractor (EC), the Test and Balance Contractor (TAB) representative, the Automatic Temperature Controls Contractor (ATC), any other installing subcontractors or suppliers of equipment. The Owner's facilities staff is also a member of the commissioning team.

B. Management. The CxA for this Project has been hired by the Owner. The CxA directs and coordinates the commissioning activities and reports to the Owner and the A/E.

C. Scheduling. The CxA will provide the initial schedule of primary commissioning events using the information gathered from the commissioning scoping meeting. The Commissioning Plan provides a format for this schedule. The timeline is fine-tuned as construction progresses. In particular, 20 days prior to startup of the primary HVAC equipment, the CxA meets with the PM and Contractors and develops a detailed commissioning schedule. The CxA will approve the commissioning schedule.

1. General Contractor shall coordinate requirements of Construction Scheduling with this work.

1.5 COMMISSIONING PROCESS

A. Commissioning Process. The following narrative provides a brief overview of the typical commissioning tasks during construction and the general order in which they occur.

1. Commissioning during construction begins with an initial commissioning meeting conducted by the CxA where the commissioning process is reviewed with the commissioning team members.
2. Additional meetings will be required throughout construction, scheduled by the CxA with necessary parties attending, to plan, scope, coordinate, schedule future activities and resolve problems.
3. Equipment documentation is submitted to the CxA during normal submittals, including detailed start-up procedures.
4. The Contractors shall develop the full start-up plan by combining the manufacturer's detailed start-up and checkout procedures from the O&M manual and the normally used field checkout sheets.
5. The Contractors shall submit all completed startup plan documentation to the CxA for review and approval.
6. The CxA writes, coordinates, witnesses and conducts functional performance test procedures. Contractors for each trade shall provide the necessary support to the CxA to complete functional testing. The CxA provides final documentation of functional performance tests.
7. Items of non-compliance are resolved at the commissioning meetings.
8. Items of non-compliance in material, installation or setup are corrected at the Contractor's expense and the system shall be retested.
9. Contractor / manufacturer equipment start-ups, ATC installation and head-end programming, and the preliminary TAB report are completed four weeks prior to Substantial Completion. This includes submission of all associated documentation to the CxA, which is required to allow sufficient time for the CxA's Functional Testing. Contingent on these items and weather conditions, functional testing may be completed prior to occupancy.
10. Deferred testing will be conducted, as specified or required.

1.6 RESPONSIBILITIES

A. The responsibilities of various parties in the commissioning process are provided in this section. The responsibilities of the HVAC, TAB, and Controls Contractors are in Section 23 08 00. The responsibilities of the Fire Protection Contractor is in Section 21 08 00. The responsibilities of the Plumbing Contractor is in Section 22 08 00. The responsibilities of the Electrical Contractors are in Section 26 08 00. It is noted that the services for the Owner's Representative, Architect, Mechanical and Electrical Designers/Engineers, and Commissioning Authority are not provided for in this contract. That is, the Contractor is not responsible for providing their services. Their responsibilities are listed here to clarify the commissioning process.

B. All Parties

1. Attend the initial commissioning meeting conducted at the start of construction, the commissioning meeting will be held 20 days prior to startup of the primary equipment, and additional meetings, as necessary.

C. Commissioning Authority (CxA)

1. The CxA is not responsible for design concept, design criteria, compliance with codes, design or general construction scheduling, cost estimating, or construction management. The CxA may assist with problem-solving, non-conformance or deficiencies, but ultimately that responsibility resides with the general contractor and the A/E. The primary role of the CxA is to ensure that the Owner's project requirements are achieved through the construction and operation of the facility.

1) Construction and Acceptance Phase

1) Installation Observation: The CxA shall observe installation of each type of commissioned feature and system to ensure that they are properly installed according to the contract

documents and manufacturers' instructions and that other building systems or components are not compromising the performance of the feature.

2) Coordinates and directs the commissioning activities in a logical, sequential and efficient manner using consistent protocols and forms, centralized documentation, clear and regular communications and consultations with all necessary parties, frequently updated timelines and schedules and technical expertise.
3) Coordinate the commissioning work and, with the GC and PM/AE, ensure that commissioning activities are being scheduled into the master schedule.
4) Plan and conduct a commissioning scoping meeting and other commissioning meetings.
5) Request and review additional information required to perform commissioning tasks, including O&M materials, contractor start-up and checkout procedures.
6) Approve systems startup by reviewing start-up reports and by selected site observation.
7) Oversee construction and startup (construction checklist) of the control system and review the final point-to-point checkout completed by the ATC Contractor.
8) Develop and document functional performance test procedures.
9) Maintain a corrective action list and a separate testing record. Provide to the Owner written progress reports and test results with recommended actions.
10) Review equipment warranties to ensure that the Owner's responsibilities are clearly defined.
11) Provide a final commissioning report.

2) Warranty Period

1) Coordinate and supervise required seasonal or deferred testing and deficiency corrections and provide the final testing documentation for the commissioning record and O&M manuals.

D. Owner's Representative (PM)

1. Construction and Acceptance Phase

a. The Owner manages the CxA contract.
b. Arrange for facility operating and maintenance personnel to attend various field commissioning activities and field training sessions.
c. Provide final approval for the completion of the commissioning work.

2. Warranty Period

a. Ensure that any seasonal or deferred testing and any deficiency issues are addressed.

1.7 SYSTEMS TO BE COMMISSIONED

A. The systems that shall be commissioned in this project include but are not limited to the following:

1. All equipment in the HVAC system

a. Building Automation System (DDC)

1) Temperature/Humidity Sensors
2) Pressure Sensors
3) Sequence of Operations
4) Damper/Valve Actuators

b. Fire Protection Systems

1) Fire Protection System
2) Sprinkler System

c. Plumbing Systems

1) Plumbing Hot Water Generation System

2) Natural Gas System
3) Domestic Water Well and Distribution Systems
4) System flows

d. Electrical Systems

1) Lighting Control System
2) Emergency Generator
3) Panels and Switchgear

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 MEETINGS

A. Initial Commissioning Meeting. Within ninety (90) days of commencement of construction, the CxA will schedule, plan and conduct a commissioning scoping meeting with the entire commissioning team in attendance. Meeting minutes will be distributed to all parties by the CxA. Information gathered from this meeting will allow the CxA to prepare the *Commissioning Plan*.

B. Equipment Startup Coordination Meeting. Twenty (20) days prior to startup of the primary equipment, the CxA meets with the PM and Installing Contractors and develops a detailed commissioning schedule. Prior to this meeting, the Contractors shall submit to the CxA the full start-up plan. The start-up plan must be submitted Twenty (20) days prior to startup of the primary equipment

C. Miscellaneous Meetings. Other meetings will be planned and conducted by the CxA as construction progresses. These meetings will cover coordination, deficiency resolution and planning issues with particular Contractors.

3.2 REPORTING

A. The CxA will provide regular reports to the Owner/PM, with increasing frequency as construction and commissioning progresses.

B. The CxA will regularly communicate with all members of the commissioning team, keeping them apprised of commissioning progress and scheduling changes through progress reports.

C. Testing or review approvals and non-conformance and deficiency reports are made regularly with the review and testing as described in later sections.

3.3 SUBMITTALS

A. The Installing Contractor shall provide one copy of approved shop drawings, sequence of operations and startup reports for all commissioned equipment to the CxA. Supplement the shop drawing data with the manufacturer's installation and start-up procedures. This material shall be identical to the literature which will be included in the Operation and Maintenance Manuals.

B. The CxA may request additional design narrative from the A/E and Controls (ATC) Contractor, depending on the completeness of the basis of design documentation and sequences provided with the Specifications.

C. These submittals to the CxA do not constitute compliance for O&M manual documentation in Division 1. The O&M manuals are the responsibility of the Contractor.

3.4 START-UP AND INITIAL CHECKOUT

A. The following procedures apply to all equipment to be commissioned.

B. General. Contractor start-ups are important to ensure that the equipment and systems are hooked up and operational. It ensures that functional performance testing (in-depth system checkout) may proceed without unnecessary delays. Each piece of equipment shall receive a full Contractor start-up. The start-up for a given system must be successfully completed prior to formal functional performance testing of equipment or subsystems will be allowed.

C. Start-up and Initial Checkout Plan. The primary role will be to ensure that there is written documentation that each of the manufacturer-recommended procedures have been completed.

1. The Contractors shall develop the full start-up plan by combining the manufacturer's detailed start-up and checkout procedures from the O&M manual and the normally used field checkout sheets. The plan shall include checklists and procedures with specific boxes or lines for recording and documenting the checking and inspections of each procedure and a summary statement with a signature block at the end of the plan.
2. The Contractors shall submit all completed startup plan documentation to the CxA for review and approval.
3. For systems that may not have adequate manufacturer startup and checkout procedures, particularly for components being integrated with other equipment, the contractor shall provide the added necessary detail and documenting format to the CxA for approval, prior to execution.
4. The full start-up plan shall consist of:

    a. The manufacturer's standard written start-up procedures copied from the installation manuals with check boxes by each procedure and a signature block added by hand at the end.
    b. The manufacturer's normally used field checkout sheets.

D. Execution of Startup and Checkout Procedures.

1. Twenty (20) days prior to startup of each item of equipment, the contractors and vendors shall schedule startup and initial checkout with the A/E, PM and CxA. A commissioning meeting will be held at this time for all parties.
2. The Contractors and vendors shall execute startup and provide the CxA with a signed and dated copy of the completed start-up and checkout procedures.
3. Only individuals that have direct knowledge and witnessed that a line item task on the checkout was actually performed shall initial or check that item off. It is not acceptable for witnessing supervisors to fill out these forms.

E. Deficiencies, Non-Conformance and Approval in Checklists and Startup.

1. The Contractors shall clearly list any outstanding items of the initial start-up and checkout procedures that were not completed successfully, at the bottom of the procedures form or on an attached sheet. The procedures form and any outstanding deficiencies are provided to the CxA within two days of test completion.
2. The CxA will review the report and submits either a non-compliance report or an approval form to the PM. The installing Contractors or vendors shall correct all areas that are deficient or incomplete in the checklists and tests in a timely manner, and shall notify the CxA as soon as outstanding items have been corrected and resubmit an updated start-up report and a Statement of Correction on the original non-compliance report. When satisfactorily completed, the CxA will recommend approval of the start-up plan to the PM.

3.5 FUNCTIONAL PERFORMANCE TESTING

A. The CxA writes, coordinates, witnesses and conducts functional performance test procedures. Contractors for each trade shall provide the necessary support to the CxA to complete functional testing. The CxA provides final documentation of functional performance tests.

B. Objectives and Scope. The objective of functional performance testing is to demonstrate that each system is operating according to the documented Owner's Project Requirements (OPR), Basis of Design (BOD) and Contract Documents. Functional testing facilitates bringing the systems from a state of substantial completion to full dynamic operation. Additionally, during the testing process, areas of deficient performance are identified and corrected, improving the operation and functioning of the systems. In general, each system should be operated through all modes of operation (seasonal, occupied, unoccupied, warm-up, cool-down, part- and full-load) where there is a specified system response. Verifying each sequence in the

sequences of operation is required. Proper responses to such modes and conditions as power failure, freeze condition, low oil pressure, no flow, equipment failure, etc. shall also be tested.

C. Coordination and Scheduling. The Contractors shall provide sufficient notice to the CxA regarding their completion schedule for the startup of all equipment and systems. The CxA shall provide written notice of testing dates. In general, functional testing is conducted after startup has been satisfactorily completed. The control system is sufficiently tested and approved by the CxA before it is used for TAB or to verify performance of other components or systems. The air balancing and water balancing is completed and debugged before functional testing of air-related or water-related equipment or systems. Testing proceeds from components to subsystems to systems. When the proper performance of all interacting individual systems has been achieved, the interface or coordinated responses between systems is checked.

3.6 DOCUMENTATION, NON-CONFORMANCE AND APPROVAL OF TESTS

A. Documentation. The CxA will document the results of all functional performance tests using the specific procedural forms developed for that purpose. The CxA will include the filled out forms in the Commissioning Record.

B. Non-Conformance.

1. If the Contractor is available, corrections of minor deficiencies identified may be made during the tests at the discretion of the CxA. In such cases the deficiency and resolution shall be documented on the procedure form.
2. Every effort shall be made to expedite the testing process and minimize unnecessary delays, while not compromising the integrity of the procedures.
3. As tests progress and deficiencies are identified, the CxA discusses the issue with the executing contractor.

    a. When there is no dispute on the deficiency, the Contractor shall accept responsibility to document and complete the corrective action.
    b. If there is a dispute about a deficiency, regarding whether it is a deficiency or who is responsible, the deficiency shall be documented and submitted to the A/E and PM for further review. Final interpretive authority is with the A/E. Final acceptance authority is with the PM.

3.7 WARRANTY PERIOD TESTING

A. During the warranty period, the CxA shall complete seasonal testing (tests delayed until weather conditions are closer to the system's design). The A/E shall coordinate resolution of design non-conformance and design deficiencies identified during warranty-period commissioning. Any final adjustments to the O&M manuals and record drawings due to the testing shall be made by the contractor. The O&M manuals are the responsibility of the contractor.

END OF SECTION 01 91 00