

PART 1 - GENERAL

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| <u>1.1 RELATED SECTIONS</u> | .1 | Section 01 33 00 - Submittal Procedures. |
| | .2 | Section 01 73 00 - Execution. |
| <u>1.2 PRECEDENCE</u> | .1 | For Federal Government projects, Division 1 Sections take precedence over technical specification sections in other Divisions. |
| <u>1.3 WORK COVERED BY CONTRACT DOCUMENTS</u> | .1 | The Work of the Contract comprises of the installation of a new high pressure air control panel, the scope of which is indicated on the drawings, including but not limit to the following:
.1 Removal of existing high pressure air tubing, fittings and valves.
.2 Removal of existing Emergency Stop button.
.3 Installation of new equipment used in the control panel, gauges, valves, connectors, etc.
.4 Relocation of exhaust system to within the HP air test cell.
.5 Installation of new tubing, fittings and valves for boosted air system.
.6 Installation of new Emergency Stop buttons with bleed valves. |
| | .2 | The work will be done in accordance with the drawings and as specified herein. |
| <u>1.4 WORK SEQUENCE</u> | .1 | Construct Work to accommodate site personnel and continued use of premises and cause minimal interruption during construction. |
| | .2 | Maintain fire access/control. |
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- 1.5 CONTRACTOR USE OF PREMISES
- .1 FMF Cape Scott is a restricted access facility. All contractors, manufacturers representatives and project personnel working on site must have PWGSC Reliability Status security clearance to access the site and must adhere to DND security conditions. In addition to security clearances, all contractors, manufacturers representatives and project personnel shall complete and acquire Visitor Clearance Request (VCR) which shall be presented to FMF Cape Scott Unit Security. Proof of VCR shall be referenced in the Contractor Employee Access List (CEAL) completed by FMF Cape Scott for site access to be granted to contractors, manufacturers representatives and project personnel.
 - .2 Limit use of premises for Work, for storage, and for access, to allow:
 - .1 Site personnel occupancy or use.
 - .2 Public usage of roadway.
 - .3 Co-ordinate use of premises under direction of Departmental Representative.
 - .4 Obtain and pay for use of additional storage or work areas needed for operations under this Contract.
 - .5 Remove or alter existing work to prevent injury or damage to portions of existing work which remain.
 - .6 Repair or replace portions of existing work which have been altered during construction operations, as directed by Departmental Representative.
 - .7 At completion of operations condition of existing work: better than that which existed before new work started to approval of Departmental Representative.
- 1.6 SITE PERSONNEL OCCUPANCY
- .1 Site personnel and Departmental Representative will occupy (or have access without restriction to) premises during entire construction period for execution of normal operations.
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| <u>1.6 SITE PERSONNEL
OCCUPANCY
(Cont'd)</u> | .2 | Co-operate with Departmental Representative in scheduling operations to minimize conflict and to facilitate site personnel usage. |
| <u>1.7 PARTIAL SITE
PERSONNEL OCCUPANCY</u> | .1 | Execute Certificate of Substantial Performance for each designated portion of Work prior to site personnel Occupancy. Contractor shall allow:
.1 Access for site personnel.
.2 Operation of electrical systems. |
| | .2 | On occupancy, Departmental Representative or site personnel will provide for occupied areas:
.1 Operation of electrical systems.
.2 Maintenance.
.3 Security. |
| | .3 | Execute Partial Interim Certificate of Completion for each designated portion of Work prior to site personnel occupancy. Contractor shall allow:
.1 Access for site personnel.
.2 Operation of electrical systems. |
| <u>1.8 ALTERATIONS,
ADDITIONS OR
REPAIRS TO EXISTING
BUILDING</u> | .1 | Execute work with least possible interference or disturbance to building operations and normal use of premises. Arrange with Departmental Representative to facilitate execution of work. |
| <u>1.9 EXISTING
SERVICES</u> | .1 | Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission. |
| | .2 | Where Work involves breaking into or connecting to existing services, give Departmental Representative 72 hours notice for necessary interruption of mechanical or electrical service throughout course of work. Minimize duration of interruptions. Carry out work at times as directed by governing authorities with minimum disturbance to vehicular traffic and tenant operations. |
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1.9 EXISTING
SERVICES
(Cont'd)

- .3 Establish location and extent of service lines in area of work before starting Work. Notify Departmental Representative of findings.
- .4 Submit schedule to and obtain approval from Departmental Representative for any shut-down or closure of active service or facility including power and communications services. Adhere to approved schedule and provide notice to affected parties.
- .5 Provide temporary services when directed by Departmental Representative to maintain critical building and tenant systems.
- .6 Where unknown services are encountered, immediately advise Departmental Representative and confirm findings in writing.
- .7 Protect, relocate or maintain existing active services. When inactive services are encountered, cap off in manner approved by authorities having jurisdiction.
- .8 Record locations of maintained, re-routed and abandoned service lines.

1.10 DOCUMENTS
REQUIRED

- .1 Maintain at job site, one copy each document as follows:
 - .1 Contract Drawings.
 - .2 Specifications.
 - .3 Addenda.
 - .4 Reviewed Shop Drawings.
 - .5 List of Outstanding Shop Drawings.
 - .6 Change Orders.
 - .7 Other Modifications to Contract.
 - .8 Field Test Reports.
 - .9 Copy of Approved Work Schedule.
 - .10 Health and Safety Plan and Other Safety Related Documents.
 - .11 Other documents as specified.

- 1.11 STANDARD HOURS .1 The Contractor must maintain Base hours for the work unless otherwise authorized by DND, through the Departmental Representative. Work that involves temporary disruption of services will be scheduled through the Departmental Representative. Give Departmental Representative minimum 72 hours notice of any disruption of services.
- .2 Site access to be at times scheduled and coordinated through Departmental Representative at least 72-hours in advance.

- 1.12 WORK SCHEDULE .1 Provide Construction Progress Chart in accordance with Section 01 32 16.07 - Construction Progress Schedule - Bar (GANTT), showing final completion of work within time period required by Contract documents.
- .2 Interim reviews of work progress based on work schedule will be conducted as decided by Departmental Representative and schedule updated by Contractor in conjunction with and to approval of Departmental Representative.

PART 2 - PRODUCTS

- 2.1 NOT USED .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED .1 Not used.

PART 1 - GENERAL

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| <u>1.1 RELATED SECTIONS</u> | .1 | Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart. |
| | .2 | Section 01 56 00 - Temporary Barriers and Enclosures. |
| <u>1.2 ACCESS AND EGRESS</u> | .1 | Design, construct and maintain temporary "access to" and "egress from" work areas, including stairs, runways, ramps or ladders and scaffolding, independent of finished surfaces and in accordance with relevant municipal, provincial and other regulations. |
| <u>1.3 USE OF SITE AND FACILITIES</u> | .1 | Execute work with the least possible interference or disturbance to the normal use of premises. Make arrangements with Departmental Representative to facilitate work as stated. |
| | .2 | Where security is reduced by work, provide temporary means to maintain security. |
| | .3 | Closures: protect work temporarily until permanent enclosures are completed. |
| | .4 | Storage: Generally, there shall be no on site storage for tools, equipment or materials. Exceptions must be approved by Departmental Representative. |
| <u>1.4 EXISTING SERVICES</u> | .1 | Notify Departmental Representative and utility companies of intended interruption of services and obtain required permission. |
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1.4 EXISTING
SERVICES
(Cont'd)

- .2 Where Work involves breaking into or connecting to existing services, give Departmental Representative 72 hours of notice for necessary interruption of mechanical or electrical service throughout course of work. Keep duration of interruptions to a minimum. Carry out interruptions after normal working hours of occupants, preferably on weekends as approved by Departmental Representative.
- .3 Provide for personnel, pedestrian and vehicular traffic.
- .4 Construct barriers in accordance with Section 01 56 00 - Temporary Barriers and Enclosures.

1.5 SPECIAL
REQUIREMENTS

- .1 Submit schedule in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
- .2 Ensure that Contractor personnel employed on site become familiar with and obey regulations including safety, fire, traffic and security regulations.
- .3 Keep within limits of work and avenues of ingress and egress.
- .4 Ingress and egress of Contractor vehicles at site is limited to area adjacent to site. On site parking is not available. Parking outside security gate can be used at contractors and project personnel's own expense.

1.6 SECURITY
CLEARANCES

- .1 Personnel employed on this project will be subject to security check. Obtain clearance, for each individual who will be required to enter the premises.
 - .2 Personnel will be checked daily at start of work shift and provided with pass which must be worn at all times. Pass must be returned at end of work shift and personnel checked out.
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<u>1.6 SECURITY CLEARANCES (Cont'd)</u>	.3	FMF Cape Scott is a restricted access facility. All personnel, manufacturers representatives and project personnel working on site must have PWGSC Reliability Status security clearance to access the site and must adhere to DND security conditions in addition to security clearances, all contractors, manufacturers representatives and project personnel shall complete and acquire Visitor Clearance Request (VCR) which shall be presented to FMF Cape Scott Unit Security. Proof of VCR shall be referenced in the Contractor Employee Access List (CEAL) completed by FMF Cape Scott for site access to be granted to contractors, manufacturers representatives and project personnel.
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<u>1.7 SITE SECURITY</u>	.1	The level of site security required for the construction area will be determined and advised to the Contractor by Departmental Representative.
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<u>1.8 BUILDING SMOKING ENVIRONMENT</u>	.1	Comply with smoking restrictions.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

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| <u>1.1 RELATED
SECTIONS</u> | .1 | Section 01 32 16.07 - Construction Progress
Schedules (Gantt) Charts. |
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| <u>1.2 ADMINISTRATIVE</u> | .1 | Schedule and administer project meetings
throughout the progress of the work at the
call of Departmental Representative. |
| | .2 | Prepare agenda for meetings. |
| | .3 | Distribute written notice of each meeting at
least four days in advance of meeting date
to Departmental Representative. |
| | .4 | Provide physical space and make arrangements
for meetings. |
| | .5 | Preside at meetings. |
| | .6 | Record the meeting minutes. Include
significant proceedings and decisions.
Identify actions by parties. |
| | .7 | Reproduce and distribute copies of minutes
within three days after meetings and
transmit to meeting participants, affected
parties not in attendance, and Departmental
Representative. |
| | .8 | Representative of Contractor, Subcontractor
and suppliers attending meetings must be
qualified and authorized to act on behalf of
party each represents. |
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| <u>1.3 PRECONSTRUCTION
MEETING</u> | .1 | Within 15 days after award of Contract,
request a meeting of parties in contract to
discuss and resolve administrative
procedures and responsibilities. |
| | .2 | Departmental Representative, major
Subcontractors, field inspectors and
supervisors will be in attendance. |
| | .3 | Establish time and location of meeting and
notify parties concerned a minimum 5 days
before meeting. |
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1.3 PRECONSTRUCTION

MEETING

(Cont'd)

- .4 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
- .5 Agenda to include:
 - .1 Appointment of official representative of participants in the Work.
 - .2 Schedule of Work: in accordance with Section 01 32 16.07 - Construction Progress Schedules - Bar (GANTT) Chart.
 - .3 Schedule of submission of shop drawings, samples, colour chips. Submit submittals in accordance with Section 01 33 00 - Submittal Procedures.
 - .4 Requirements for temporary facilities, site sign, offices, storage sheds, utilities, fences in accordance with Section 01 52 00 - Construction Facilities.
 - .5 Delivery schedule of specified equipment in accordance with corresponding section.
 - .6 Site security in accordance with Section 01 56 00 - Temporary Barriers and Enclosures
 - .7 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative requirements.
 - .8 Departmental Representative or site personnel provided products.
 - .9 Record drawings in accordance with Section 01 33 00 - Submittal Procedures.
 - .10 Maintenance manuals in accordance with Section 01 78 00 - Closeout Submittals.
 - .11 Take-over procedures, acceptance, warranties in accordance with Section 01 78 00 - Closeout Submittals.
 - .12 Monthly progress claims, administrative procedures, photographs, hold backs.
 - .13 Appointment of inspection and testing agencies or firms.
 - .14 Insurances, transcript of policies.

1.4 PROGRESS

MEETINGS

- .1 During course of Work and 2 weeks prior to project completion, schedule progress meetings bi-weekly.
 - .2 Contractor, major Subcontractors involved in Work and Departmental Representative are to be in attendance.
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1.4 PROGRESS

MEETINGS

(Cont'd)

- .3 Notify parties minimum 4 days prior to meetings.
- .4 Record minutes of meetings and circulate to attending parties and affected parties not in attendance within 3 days after meeting.
- .5 Agenda to include the following:
 - .1 Review, approval of minutes of previous meeting.
 - .2 Review of Work progress since previous meeting.
 - .3 Field observations, problems, conflicts.
 - .4 Problems which impede construction schedule.
 - .5 Review of off-site fabrication delivery schedules.
 - .6 Corrective measures and procedures to regain projected schedule.
 - .7 Revision to construction schedule.
 - .8 Progress schedule, during succeeding work period.
 - .9 Review submittal schedules: expedite as required.
 - .10 Maintenance of quality standards.
 - .11 Review proposed changes for affect on construction schedule and on completion date.
 - .12 Other business.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

1.1 DEFINITIONS

- .1 Activity: element of Work performed during course of Project. Activity normally has expected duration, and expected cost and expected resource requirements. Activities can be subdivided into tasks.
 - .2 Bar Chart (GANTT Chart): graphic display of schedule-related information. In typical bar chart, activities or other Project elements are listed down left side of chart, dates are shown across top, and activity durations are shown as date-placed horizontal bars. Generally Bar Chart should be derived from commercially available computerized project management system.
 - .3 Baseline: original approved plan (for project, work package, or activity), plus or minus approved scope changes.
 - .4 Construction Work Week: Monday to Friday, inclusive, will provide five day work week and define schedule calendar working days as part of Bar (GANTT) Chart submission.
 - .5 Duration: number of work periods (not including holidays or other nonworking periods) required to complete activity or other project element. Usually expressed as workdays or workweeks.
 - .6 Master Plan: summary-level schedule that identifies major activities and key milestones.
 - .7 Milestone: significant event in project, usually completion of major deliverable.
 - .8 Project Schedule: planned dates for performing activities and the planned dates for meeting milestones. Dynamic, detailed record of tasks or activities that must be accomplished to satisfy Project objectives. Monitoring and control process involves using Project Schedule in executing and controlling activities and is used as basis for decision making throughout project life cycle.
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| <u>1.1 DEFINITIONS</u>
(Cont'd) | .9 | Project Planning, Monitoring and Control System: overall system operated by Departmental Representative to enable monitoring of project work in relation to established milestones. |
| <u>1.2 REQUIREMENTS</u> | .1 | Ensure Master Plan and Detail Schedules are practical and remain within specified Contract duration. |
| | .2 | Plan to complete Work in accordance with prescribed milestones and time frame. |
| | .3 | Limit activity durations to maximum of approximately 10 working days, to allow for progress reporting. |
| | .4 | Ensure that it is understood that Award of Contract or time of beginning, rate of progress, Interim Certificate and Final Certificate as defined times of completion are of essence of this contract. |
| <u>1.3 SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Submit to Departmental Representative within 10 working days of Award of Contract Bar (GANTT) Chart as Master Plan for planning, monitoring and reporting of project progress. |
| | .3 | Submit Project Schedule to Departmental Representative within 10 working days of receipt of acceptance of Master Plan. |
| <u>1.4 MASTER PLAN</u> | .1 | Structure schedule to allow orderly planning, organizing and execution of Work as Bar Chart (GANTT). |
| | .2 | Departmental Representative will review and return revised schedules within 10 working days. |
| | .3 | Revise impractical schedule and resubmit within 10 working days. |
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<u>1.4 MASTER PLAN</u> <u>(Cont'd)</u>	.4	Accepted revised schedule will become Master Plan and be used as baseline for updates.
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<u>1.5 PROJECT</u> <u>SCHEDULE</u>	.1	Develop detailed Project Schedule derived from Master Plan.
	.2	Ensure detailed Project Schedule includes as minimum milestone and activity types as follows: <ul style="list-style-type: none">.1 Award..2 Shop Drawings, Samples..3 Permits..4 Mobilization..5 Electrical..6 Demolition..7 Testing and Commissioning.

<u>1.6 PROJECT</u> <u>SCHEDULE REPORTING</u>	.1	Update Project Schedule on bi-weekly basis reflecting activity changes and completions, as well as activities in progress.
	.2	Include as part of Project Schedule, narrative report identifying Work status to date, comparing current progress to baseline, presenting current forecasts, defining problem areas, anticipated delays and impact with possible mitigation.

<u>1.7 PROJECT</u> <u>MEETINGS</u>	.1	Discuss Project Schedule at regular site meetings, identify activities that are behind schedule and provide measures to regain slippage. Activities considered behind schedule are those with projected start or completion dates later than current approved dates shown on baseline schedule.
	.2	Weather related delays with their remedial measures will be discussed and negotiated.

PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not used.
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D-200 High Pressure Air	Construction	Sect 01 32 16.07
Test Facility Upgrades	Progress Schedule -	Page 4
CFB Halifax Dockyard, FMFCS	Bar (GANTT) Chart	
Project No. R.077547.001		2017-01-24

PART 3 - EXECUTION

3.1 NOT USED .1 Not used.

PART 1 - GENERAL

- 1.1 ADMINISTRATIVE
- .1 Submit to Departmental Representative submittals listed for review. Submit promptly and in orderly sequence to not cause delay in Work. Failure to submit in ample time is not considered sufficient reason for extension of Contract Time and no claim for extension by reason of such default will be allowed.
 - .2 Do not proceed with Work affected by submittal until review is complete.
 - .3 Present shop drawings, product data, samples and mock-ups in SI Metric units.
 - .4 Where items or information is not produced in SI Metric units converted values are acceptable.
 - .5 Review submittals prior to submission to Departmental Representative. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and co-ordinated with requirements of Work and Contract Documents. Submittals not stamped, signed, dated and identified as to specific project will be returned without being examined and considered rejected.
 - .6 Notify Departmental Representative, in writing at time of submission, identifying deviations from requirements of Contract Documents stating reasons for deviations.
 - .7 Verify field measurements and affected adjacent Work are co-ordinated.
 - .8 Contractor's responsibility for errors and omissions in submission is not relieved by Departmental Representative's review of submittals.
 - .9 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Departmental Representative review.
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1.1 ADMINISTRATIVE (Cont'd) .10 Keep one reviewed copy of each submission on site.

1.2 SHOP DRAWINGS AND PRODUCT DATA .1 The term "shop drawings" means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by Contractor to illustrate details of a portion of Work.

.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been co-ordinated, regardless of Section under which adjacent items will be supplied and installed. Indicate cross references to design drawings and specifications.

.3 Allow 10 days for Departmental Representative's review of each submission.

.4 Adjustments made on shop drawings by Departmental Representative are not intended to change Contract Price. If adjustments affect value of Work, state such in writing to Departmental Representative prior to proceeding with Work.

.5 Make changes in shop drawings as Departmental Representative may require, consistent with Contract Documents. When resubmitting, notify Departmental Representative in writing of revisions other than those requested.

.6 Accompany submissions with transmittal letter, in duplicate, containing:

- .1 Date.
- .2 Project title and number.
- .3 Contractor's name and address.
- .4 Identification and quantity of each shop drawing, product data and sample.
- .5 Other pertinent data.

.7 Submissions include:

- .1 Date and revision dates.
- .2 Project title and number.
- .3 Name and address of:

- 1.2 SHOP DRAWINGS .7 (Cont'd)
AND PRODUCT DATA .3 (Cont'd)
(Cont'd)
- .1 Subcontractor.
 - .2 Supplier.
 - .3 Manufacturer.
 - .4 Contractor's stamp, signed by Contractor's authorized representative certifying approval of submissions, verification of field measurements and compliance with Contract Documents.
 - .5 Details of appropriate portions of Work as applicable:
 - .1 Fabrication.
 - .2 Layout, showing dimensions, including identified field dimensions, and clearances.
 - .3 Setting or erection details.
 - .4 Capacities.
 - .5 Performance characteristics.
 - .6 Standards.
 - .7 Operating weight.
 - .8 Wiring diagrams.
 - .9 Single line and schematic diagrams.
 - .10 Relationship to adjacent work.
 - .8 After Departmental Representative's review, distribute copies.
 - .9 Submit electronic copy of shop drawings for each requirement requested in specification Sections and as Departmental Representative may reasonably request.
 - .10 Submit electronic copy of product data sheets or brochures for requirements requested in specification Sections and as requested by Departmental Representative where shop drawings will not be prepared due to standardized manufacture of product.
 - .11 Submit electronic copy of test reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Report signed by authorized official of testing laboratory that material, product or system identical to material, product or system to be provided has been tested in accord with specified requirements.
 - .2 Testing must have been within 3 years of date of contract award for project.
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1.2 SHOP DRAWINGS
AND PRODUCT DATA
(Cont'd)

- .12 Submit electronic copy of certificates for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Statements printed on manufacturer's letterhead and signed by responsible officials of manufacturer of product, system or material attesting that product, system or material meets specification requirements.
 - .2 Certificates must be dated after award of project contract complete with project name.
 - .13 Submit electronic copy and 2 hardcopies of manufacturers instructions for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Pre-printed material describing installation of product, system or material, including special notices and Material Safety Data Sheets concerning impedances, hazards and safety precautions.
 - .14 Submit 2 electronic copy of Manufacturer's Field Reports for requirements requested in specification Sections and as requested by Departmental Representative.
 - .1 Documentation of the testing and verification actions taken by manufacturer's representative to confirm compliance with manufacturer's standards or instructions.
 - .15 Submit 1 copies of Operation and Maintenance Data for requirements requested in specification Sections and as requested by Departmental Representative.
 - .16 Delete information not applicable to project.
 - .17 Supplement standard information to provide details applicable to project.
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<u>1.2 SHOP DRAWINGS AND PRODUCT DATA (Cont'd)</u>	.18	If upon review by Departmental Representative, no errors or omissions are discovered or if only minor corrections are made, copies will be returned and fabrication and installation of Work may proceed. If shop drawings are rejected, noted copy will be returned and resubmission of corrected shop drawings, through same procedure indicated above, must be performed before fabrication and installation of Work may proceed.
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<u>1.3 CERTIFICATES AND TRANSCRIPTS</u>	.1	Immediately after award of Contract, submit Workers' Compensation Board status.
	.2	Submit transcription of insurance immediately after award of Contract.

PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

1.1 FIRE DEPARTMENT BRIEFING .1 Departmental Representative will co-ordinate arrangements for contractor for briefing on Fire Safety at pre-work conference by Fire Chief before work is commenced.

1.2 REPORTING FIRES .1 Know location of nearest fire alarm box and telephone, including emergency phone number.
.2 Report immediately fire incidents to Fire Department as follows:
.1 Activate nearest fire alarm box; or
.2 Telephone.
.3 Person activating fire alarm box will remain at box to direct Fire Department to scene of fire.
.4 When reporting fire by telephone, give location of fire, name or number of building and be prepared to verify location.

1.3 INTERIOR AND EXTERIOR FIRE PROTECTION AND ALARM SYSTEMS .1 Fire protection and alarm system will not be:
.1 Obstructed;
.2 Shut-off; and
.3 Left inactive at end of working day or shift without authorization from Fire Chief.
.2 Fire hydrants, standpipes and hose systems will not be used for other than fire-fighting purposes unless authorized by Fire Chief.

1.4 FIRE EXTINGUISHERS .1 Supply fire extinguishers, as scaled by Fire Chief, necessary to protect work in progress and contractor's physical plant on site.

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| <u>1.5 BLOCKAGE OF
ROADWAYS</u> | .1 | Advise Fire Chief of work that would impede fire apparatus response. This includes violation of minimum overhead clearance, as prescribed by Fire Chief, erecting of barricades. |
| <u>1.6 SMOKING
PRECAUTIONS</u> | .1 | Observe smoking regulations. Smoking is not allowed. |
| <u>1.7 RUBBISH AND
WASTE MATERIALS</u> | .1 | Keep rubbish and waste materials at minimum quantities. |
| | .2 | Burning of rubbish is prohibited. |
| | .3 | Removal:
.1 Remove rubbish from work site at end of work day or shift or as directed. |
| | .4 | Storage:
.1 Store oily waste in approved receptacles to ensure maximum cleanliness and safety.
.2 Deposit greasy or oily rags and materials subject to spontaneous combustion in approved receptacles and remove specified. |
| <u>1.8 FLAMMABLE AND
COMBUSTIBLE LIQUIDS</u> | .1 | Handling, storage and use of flammable and combustible liquids governed by current National Fire Code of Canada. |
| | .2 | Keep flammable and combustible liquids such as gasoline, kerosene and naphtha for ready use in quantities not exceeding 45 litres provided they are stored in approved safety cans bearing Underwriters' Laboratory of Canada or Factory Mutual seal of approval. Storage of quantities of flammable and combustible liquids exceeding 45 litres for work purposes requires permission of Fire Chief. |
| | .3 | Transfer of flammable and combustible liquids is prohibited within buildings or jetties. |
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1.8 FLAMMABLE AND
COMBUSTIBLE LIQUIDS
(Cont'd)

- .4 Transfer of flammable and combustible liquids will not be carried out in vicinity of open flames or any type of heat-producing devices.
- .5 Do not use flammable liquids having flash point below 38 degrees C such as naphtha or gasoline as solvents or cleaning agents.
- .6 Store flammable and combustible waste liquids, for disposal, in approved containers located in safe ventilated area. Keep quantities to a minimum and Fire Department is to be notified when disposal is required.

1.9 HAZARDOUS
SUBSTANCES

- .1 Work entailing use of toxic or hazardous materials, chemicals and/or explosives, or otherwise creating hazard to life, safety or health, in accordance with National Fire Code of Canada.
- .2 Obtain from Fire Chief a "Hot Work" permit for work involving welding, burning or use of blow torches and salamanders, in buildings or facilities.
- .3 When Work is carried out in dangerous or hazardous areas involving use of heat, provide fire watchers equipped with sufficient fire extinguishers. Determination of dangerous or hazardous areas along with level of protection necessary for Fire Watch is at discretion of Fire Chief. Contractors are responsible for providing fire watch service for work on scale established and in conjunction with Fire Chief at pre-work conference.
- .4 Provide ventilation where flammable liquids, such as lacquers or urethanes are used, eliminate sources of ignition. Inform Fire Chief prior to and at cessation of such work.

1.10 QUESTIONS
AND/OR
CLARIFICATION

- .1 Direct questions or clarification on Fire Safety in addition to above requirements to Fire Chief.
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| <u>1.11 FIRE
INSPECTION</u> | .1 | Co-ordinate site inspections by Fire Chief through Departmental Representative. |
| | .2 | Allow Fire Chief unrestricted access to work site. |
| | .3 | Co-operate with Fire Chief during routine fire safety inspection of work site. |
| | .4 | Immediately remedy unsafe fire situations observed by Fire Chief. |

PART 2 - PRODUCTS

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| <u>2.1 NOT USED</u> | .1 | Not Used. |
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PART 3 - EXECUTION

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| <u>3.1 NOT USED</u> | .1 | Not Used. |
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PART 1 - GENERAL

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| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |
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| <u>1.2 DEFINITIONS</u> | .1 | Environmental Pollution and Damage: presence of chemical, physical, biological elements or agents which adversely affect human health and welfare; unfavourably alter ecological balances of importance to human life; affect other species of importance of humankind; or degrade environment aesthetically, culturally and/or historically. |
| | .2 | Environmental Protection: prevention/control of pollution and habitat or environment disruption during construction. Control of environmental pollution and damage requires consideration of land, water, and air; biological and cultural resources; and includes management of visual aesthetics; noise; solid, chemical, gaseous, and liquid waste; radiant energy and radioactive material as well as other pollutants. |
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|-----------------------|----|---|
| <u>1.3 SUBMITTALS</u> | .1 | Submittals: in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Within 7 working days of contract award, submit Environmental Protection Plan for review and approval by Departmental Representative. Environmental Protection Plan is to present comprehensive overview of known or potential environmental issues which must be addressed during the project. |
| | .3 | Address topics below at level of detail commensurate with environmental issue and required construction tasks. |
| | .4 | Environmental protection plan: include:
.1 Names of persons responsible for ensuring adherence to Environmental Protection Plan. |
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1.3 SUBMITTALS
(Cont'd)

- .4 (Cont'd)
- .2 Names and qualifications of persons responsible for manifesting hazardous waste to be removed from site.
 - .3 Names and qualifications of persons responsible for training site personnel. Person responsible for training must be considered competent person as defined by the Nova Scotia Occupational Health and Safety Act.
 - .4 Descriptions of environmental protection personnel training program.
 - .5 Erosion and sediment control plan which identifies type and location of erosion and sediment controls to be provided including monitoring and reporting requirements to assure that control measure are in compliance with erosion and sediment control plan, Federal, Provincial, and Municipal laws and regulations.
 - .6 Drawings showing locations of material storage areas, structures, sanitary facilities, and stockpiles of excess or spoil materials to be contained on site.
 - .7 Traffic control plans.
 - .8 Work area plan showing proposed activity in each portion of area and identifying areas of limited use or non-use. Plan to include measures for marking limits of use areas.
 - .9 Spill Control Plan: including procedures, instructions, and reports to be used in event of unforeseen spill of regulated substance.
 - .10 Non-Hazardous and hazardous solid waste disposal plan identifying methods and locations for solid waste disposal including clearing debris.
 - .11 Air pollution control plan detailing provisions to assure that dust, debris, materials, and trash, do not become air borne and travel off project site.
 - .12 Contaminant prevention plan that: identifies potentially hazardous substances to be used on job site; identifies intended actions to prevent introduction of such materials into air, water, or ground; and details provisions for compliance with Federal, Provincial, and Municipal laws and regulations for storage and handling of these materials.
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1.3 SUBMITTALS
(Cont'd)

- .4 (Cont'd)
 - .13 Historical, archaeological, cultural resources, biological resources and wetlands plan that defines procedures for identifying and protecting historical, archaeological, cultural resources, biological resources and wetlands.
- .5 Environmental protection and mitigation measures shall reflect the need to comply with Section 36(3) of the Fisheries Act and Section 5.1(1) of the Migratory Bird Convention Act.

1.4 EMERGENCY
NOTIFICATION

- .1 The actions noted in this Article shall be taken when an accidental release of any of the following occurs:
 - .1 Flammable, poisonous or caustic gas;
 - .2 Flammable, poisonous or caustic liquid;
 - .3 Bio-hazardous/infections substances;
 - .4 PCB;
 - .5 Sewage;
 - .6 Contaminated water; or
 - .7 Asbestos.
- .2 An environmental incident has occurred when there has been an uncontrolled or unintended release of a hazardous waste, hazardous liquid, hazardous gas and/or dangerous good.
- .3 Take the following action when any of the above have occurred:
 - .1 Control the release, if possible;
 - .2 Contact DND Fire Hall or 911;
 - .3 Contact Departmental Representative. Departmental representative will inform MARLANT Safety and Environment.

1.5 FIRES

- .1 Fires and burning of rubbish on site not permitted.
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1.6 DISPOSAL OF
WASTES

- .1 Do not bury Construction and Demolition C&D Debris, rubbish and waste materials on site. C&D Debris means materials which are normally used in the construction of buildings, structures, roadways, walls and other landscaping material, and includes, but is not limited to, soil, asphalt, brick, mortar, drywall, plaster, cellulose, fiberglass, fibres, gyproc, lumber, wood, asphalt shingles, and metals.
- .2 Do not dispose of waste or volatile materials, such as mineral spirits, oil or paint thinner into waterways, storm or sanitary sewers.

1.7 DUST CONTROL

- .1 The application of clean water is the preferred method of dust suppression and shall be considered for use by Contractor wherever economical and practical to use.
- .2 If either calcium chloride or magnesium chloride is considered for use as a dust suppressant, it shall only be used in accordance with guidance offered in the Environment Canada report entitled, Best Practices for the Use and Storage of Chloride-Based Dust Suppressants at:
<http://www.ec.gc.ca/nopp/roadsalt/reports/chlorideBP/en/toc.cfm>.

1.8 POLLUTION
CONTROL

- .1 Control emissions from equipment and plant to local authorities' emission requirements.
 - .2 Prevent sandblasting and other extraneous materials from contaminating air beyond application area, by providing temporary enclosures.
 - .3 Provide petroleum spill kits at the work site to quickly cleanup and contain petroleum spills from plant, should they occur. Ensure site personnel are familiar with and trained in the use of site petroleum spill kits.
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- 1.9 WORK NEAR WATER BODIES
- .1 Filling, dredging or the use of explosives in the work shall not be allowed.
 - .2 Carry out work in a manner that does not result in the deposit of toxic or deleterious substances (e.g. sediment, uncured concrete, fuel, lubricants, etc.) into water frequented by fish,
 - .3 Equipment shall at no time enter the water.
 - .4 Waste construction materials shall not enter the water.

- 1.10 ENVIRONMENTAL MANagements
- .1 Any vehicles and equipment present in the project areas, when not in use, are not to be left idling.

- 1.11 ENVIRONMENTAL INCIDENT OR EMERGENCY
- .1 In the event of an environmental incident or emergency such as:
 - .1 Chemical spill or petroleum spill.
 - .2 Poisonous or caustic gas emission.
 - .3 Biological or chemical explosion.
 - .4 Hazardous material spill.
 - .5 Sewage spill.
 - .6 Release of contaminated water into waterways.
 - .2 The Contractor or his employees shall:
 - .1 Notify the Contractor's job superintendent.
 - .2 Notify Departmental Representative and give type of emergency.
 - .3 The Contractor is to submit to Departmental Representative a copy of Environmental Protection Plan, and Spill Response Plan for approval within 7 days of contract award.

- 1.12 VEHICLE REFUELING
- .1 Refueling of equipment to be performed in locations as directed by Departmental Representative.
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1.12 VEHICLE
REFUELING
(Cont'd)

- .2 Do not refuel equipment within 30 metres of any watercourse or storm water catch basin unless protection against spills is in place and location is approved by Departmental Representative.
- .3 Contractors to have drip pans sized for amounts of product to be recovered and customized to fit under pieces of equipment to perform routine maintenance to equipment while maintaining equipment on property. Drip pans to be used whenever leaving equipment on site or parking overnight when not in use.
- .4 Parking of equipment on site to be in locations away from watercourses and as approved by Departmental Representative. Equipment with leaks or poor mechanical repair to be removed from site when so ordered by Departmental Representative.
- .5 Use petroleum containers approved for products with no spill fill spouts, equipped with a self closing valve, for dispensing fuels. Prevent any flow of fuel until the nozzle is inserted into the receiving container. On removal from the receiving container the slide valve should close to eliminate any fuel spill. The nozzle to be equipped with an automatic vent, eliminating the need for the user to open or close air inlets on the pouring container.
- .6 Nozzle to support the weight of the pouring container. Nozzles to automatically stop the flow when the receiving container becomes full. The nozzle to be such that it reduces evaporation losses of volatile organic compounds during the fuel transfer.
- .7 All spills of hydrocarbon based products such as gasoline, kerosene, naptha, lubricating oils, engine oils, greases and de-icing fluids or antifreeze be reported immediately to Departmental Representative.

1.13 SPILLS

- .1 The Contractor is to submit a copy of its Spill Response Plan for approval to Departmental Representative within 7 working days of Contract award.
-

1.13 SPILLS
(Cont'd)

- .2 Disposal of spilled materials to be off property and at approved locations for materials to be disposed of.
 - .3 When parking of equipment on site, the equipment is to be secured from entry and inspected for fluid leaks.
 - .4 Contractor to protect all wells, catch basins, dry wells, drains and water courses from contamination in the event of a spill.
 - .5 All equipment to be used for the Work of the Contract will be free of fluid leaks and in good working order. Equipment will be inspected for fluid leaks before each use and at regular intervals during use. Equipment not in good repair to be immediately removed from use.
 - .6 All spills regardless of size must be reported to the Departmental Representative. The Departmental Representative will be responsibly to report the spill to MARL SE. For spills such as but not limited to:
 - .1 POL products.
 - .2 Glycol, hydraulic oil, concrete form oil.
 - .3 Battery acid spill.
 - .4 Any other hazardous/deleterious substance.
 - .5 Any release of halocarbons, including releases from refrigerators, chillers, air conditioners (vehicles and building).
 - .6 Any spill that enters a drain, ditch or water body regardless of amount.
 - .7 For spills occurring, the Contractor is to immediately remove as much or all of the contaminated soils created by the spill as possible.
 - .8 Contaminated soils/materials to be placed in leak proof containers compatible with the contaminates spilled and shall be covered to prevent ingress of weather.
 - .9 Any remaining clean-up to be performed at no extra cost to PWGSC. Clean-ups to be completed to the Departmental Representative's satisfaction.
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- 1.13 SPILLS
(Cont'd)
- .10 Report any spills of petroleum or other hazardous materials to the Base /Wing Fire Hall and the Departmental Representative.
- 1.14 SPILL CONTROL KITS
- .1 Contractor to have at the work site a spill control kit consisting of the following equipment, at a minimum:
- .1 A spaded shovel.
 - .2 A stable broom.
 - .3 A broad nose shovel.
 - .4 Container(s) suitable, compatible to and of sufficient size to contain petroleum products being used with equipment.
 - .5 Absorbents.
 - .6 Rags.
 - .7 Metal container for soiled rags.
 - .8 Booms when working next to a water course.
- .2 Spill control kit to be inspected and approved by Departmental Representative prior to start of work. Spill control kits to be available to Contractor employees at all areas where Work is being performed and until completion of the Work.
- .3 Contractor employees to be trained in the use of spill control kits and the equipment they contain.
- 1.15 NOTIFICATION
- .1 Departmental Representative will notify Contractor in writing of observed noncompliance with Federal, Provincial or Municipal environmental laws or regulations, permits, and other elements of Contractor's Environmental Protection plan.
- .2 Contractor: after receipt of such notice, inform Departmental Representative of proposed corrective action and take such action for approval by Departmental Representative.
- .3 Departmental Representative will issue stop order of work until satisfactory corrective action has been taken.
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<u>1.15 NOTIFICATION (Cont'd)</u>	.4	No time extensions granted or equitable adjustments allowed to Contractor for such suspensions.
	.5	Any changes in the plans shall be reported to the Departmental Representative who will report to the appropriate authority having jurisdiction, prior to the commencement of any work.

<u>1.16 HALOCARBON MANAGEMENT</u>	.1	If work activities are to take place on equipment or infrastructure containing halocarbons: .1 The contractor is to ensure that all works adhere to the 2003 Federal Halocarbon Regulations (FHR) and other applicable federal, provincial, and municipal legislature. .2 The contractor is to complete MARLANT's Halocarbon Management Information Form and provide a copy of the Form to the Departmental Representative within 48 hours of the completion of these work activities. The Departmental Representative will provide form to contractor after project award.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

<u>3.1 NOT USED</u>	.1	Not Used.
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PART 1 - GENERAL

1.1 INSPECTION

- .1 Allow Departmental Representative access to Work. If part of Work is in preparation at locations other than Place of Work, allow access to such Work whenever it is in progress.
- .2 Give timely notice requesting inspection if Work is designated for special tests, inspections or approvals by Departmental Representative instructions, or law of Place of Work.
- .3 If Contractor covers or permits to be covered Work that has been designated for special tests, inspections or approvals before such is made, uncover such Work, have inspections or tests satisfactorily completed and make good such Work.
- .4 Departmental Representative will order part of Work to be examined if Work is suspected to be not in accordance with Contract Documents. If, upon examination such work is found not in accordance with Contract Documents, correct such Work and pay cost of examination and correction. If such Work is found in accordance with Contract Documents, Departmental Representative shall pay cost of examination and replacement.

1.2 INDEPENDENT
INSPECTION AGENCIES

- .1 Independent Inspection/Testing Agencies will be engaged by Departmental Representative for purpose of inspecting and/or testing portions of Work. Cost of such services will be borne by Departmental Representative.
 - .2 Provide equipment required for executing inspection and testing by appointed agencies.
 - .3 Employment of inspection/testing agencies does not relax responsibility to perform Work in accordance with Contract Documents.
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<u>1.2 INDEPENDENT INSPECTION AGENCIES (Cont'd)</u>	.4	If defects are revealed during inspection and/or testing, appointed agency will request additional inspection and/or testing to ascertain full degree of defect. Correct defect and irregularities as advised by Departmental Representative at no cost to Departmental Representative. Pay costs for retesting and reinspection.
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<u>1.3 ACCESS TO WORK</u>	.1	Allow inspection/testing agencies access to Work, off site manufacturing and fabrication plants.
	.2	Co-operate to provide reasonable facilities for such access.

<u>1.4 PROCEDURES</u>	.1	Notify appropriate agency and Departmental Representative in advance of requirement for tests, in order that attendance arrangements can be made.
	.2	Submit samples and/or materials required for testing, as specifically requested in specifications. Submit with reasonable promptness and in orderly sequence to not cause delays in Work.
	.3	Provide labour and facilities to obtain and handle samples and materials on site. Provide sufficient space to store and cure test samples.

<u>1.5 REJECTED WORK</u>	.1	Remove defective Work, whether result of poor workmanship, use of defective products or damage and whether incorporated in Work or not, which has been rejected by Departmental Representative as failing to conform to Contract Documents. Replace or re-execute in accordance with Contract Documents.
	.2	Make good other Contractor's work damaged by such removals or replacements promptly.

<u>1.5 REJECTED WORK</u> (Cont'd)	.3	If in opinion of Departmental Representative it is not expedient to correct defective Work or Work not performed in accordance with Contract Documents, Departmental Representative will deduct from Contract Price difference in value between Work performed and that called for by Contract Documents, amount of which will be determined by Departmental Representative.
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<u>1.6 REPORTS</u>	.1	Submit 4 copies of inspection and test reports to Departmental Representative.
	.2	Provide copies to subcontractor of work being inspected or tested or manufacturer or fabricator of material being inspected or tested.

<u>1.7 TESTS AND MIX DESIGNS</u>	.1	Furnish test results and mix designs as requested.
	.2	Cost of tests and mix designs beyond those called for in Contract Documents or beyond those required by law of Place of Work will be appraised by Departmental Representative and may be authorized as recoverable.

<u>1.8 MILL TESTS</u>	.1	Submit mill test certificates as requested.
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<u>1.9 EQUIPMENT AND SYSTEMS</u>	.1	Submit adjustment and balancing reports for mechanical, electrical and building equipment systems.
	.2	Refer to specific sections for definitive requirements.

PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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D-200 High Pressure Air	Quality Control	Section 01 45 00
Test Facility Upgrades		Page 4
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PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

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|-------------------------------------|----|---|
| <u>1.1 REFERENCES</u> | .1 | Canadian General Standards Board (CGSB)
.1 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood.
.2 CGSB 1.59-97, Alkyd Exterior Gloss Enamel. |
| | .2 | Canadian Standards Association (CSA International)
.1 CSA-A23.1/A23.2-14, Concrete Materials and Methods of Concrete Construction/Methods of Test and Standard Practices for Concrete.
.2 CSA-0121-08(R2013), Douglas Fir Plywood.
.3 CAN/CSA-S269.2-M1987(R2003), Access Scaffolding for Construction Purposes.
.4 CAN/CSA-Z321-96(R2006), Signs and Symbols for the Occupational Environment. |
| | .3 | U.S. Environmental Protection Agency (EPA) / Office of Water
.1 EPA 832R92005, Storm Water Management for Construction Activities: Developing Pollution Prevention Plans and Best Management Practices. |
| <u>1.2 SUBMITTALS</u> | .1 | Provide submittals in accordance with Section 01 33 00 - Submittal Procedures. |
| <u>1.3 INSTALLATION AND REMOVAL</u> | .1 | Prepare site plan indicating proposed location and dimensions of area to be fenced and used by Contractor, number of trailers to be used, avenues of ingress/egress to fenced area and details of fence installation. |
| | .2 | Indicate use of supplemental or other staging area. |
| | .3 | Provide construction facilities in order to execute work expeditiously. |
| | .4 | Remove from site all such work after use. |
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| 1.4 SITE
<u>STORAGE/LOADING</u> | .1 | Confine work and operations of employees by Contract Documents. Do not unreasonably encumber premises with products. |
| | .2 | Do not load or permit to load any part of Work with weight or force that will endanger Work. |

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| 1.5 CONSTRUCTION
<u>PARKING</u> | .1 | Parking will not be permitted on site, unless otherwise approved by the Departmental Representative. Parking lot outside security gate can be used at contractors and project personnel's own expense. |
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| 1.6 SECURITY
<u></u> | .1 | Provide and pay for responsible security personnel to guard site and contents of site outside normal working hours. |
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| 1.7 EQUIPMENT, TOOL
AND MATERIALS
<u>STORAGE</u> | .1 | Generally, there shall be no on site storage for tools, equipment and materials. Exceptions must be approved in writing by Departmental Representative. |
| | .2 | Provide and maintain, in clean and orderly condition, lockable weatherproof sheds for storage of tools, equipment and materials. |
| | .3 | Locate materials not required to be stored in weatherproof sheds on site in manner to cause least interference with work activities. |

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| 1.8 SANITARY
<u>FACILITIES</u> | .1 | Provide sanitary facilities for work force in accordance with governing regulations and ordinances. |
| | .2 | Post notices and take precautions as required by local health authorities. Keep area and premises in sanitary condition. |
| | .3 | When permanent water and drain connections are completed, provide temporary water closets and urinals complete with temporary enclosures, inside building. |
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1.8 SANITARY
FACILITIES
(Cont'd)

- .4 Permanent sanitary facilities may be used in lieu of temporary/portable facilities on approval of Departmental Representative.

1.9 CONSTRUCTION
SIGNAGE

- .1 Signs and notices for safety and instruction in both official languages Graphic symbols to CAN/CSA-Z321.
- .2 No other signs or advertisements, other than warning signs, are permitted on site.
- .3 Maintain approved signs and notices in good condition for duration of project, and dispose of off site on completion of project or earlier if directed by Departmental Representative.

1.10 CLEAN-UP

- .1 Remove construction debris, waste materials, packaging material from work site daily.
- .2 Clean dirt or mud tracked onto paved or surfaced roadways.
- .3 Store materials resulting from demolition activities that are salvageable.
- .4 Stack stored new or salvaged material not in construction facilities.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

- | | | |
|--|----|---|
| <u>1.1 REFERENCES</u> | .1 | Canadian General Standards Board (CGSB)
.1 CGSB 1.59-97, Alkyd Exterior Gloss Enamel.
.2 CAN/CGSB 1.189-00, Exterior Alkyd Primer for Wood. |
| | .2 | Canadian Standards Association (CSA International)
.1 CSA-O121-08(R2013), Douglas Fir Plywood. |
| <u>1.2 INSTALLATION AND REMOVAL</u> | .1 | Provide temporary controls in order to execute Work expeditiously. |
| | .2 | Remove from site all such work after use. |
| <u>1.3 GUARD RAILS AND BARRICADES</u> | .1 | Provide secure, rigid guard rails and barricades around deep excavations, open shafts, open stair wells, open edges of floors and roofs. |
| | .2 | Provide as required by governing authorities or as requested by Departmental Representative. |
| <u>1.4 ACCESS TO SITE</u> | .1 | Provide and maintain access roads, sidewalk crossings, ramps and construction runways as may be required for access to Work. |
| <u>1.5 FIRE ROUTES</u> | .1 | Maintain access to property including overhead clearances for use by emergency response vehicles. |
| <u>1.6 PROTECTION FOR OFF-SITE AND PUBLIC PROPERTY</u> | .1 | Protect surrounding private and public property from damage during performance of Work. |
| | .2 | Contractor responsible for damage incurred. |
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1.7 WASTE MANAGEMENT AND DISPOSAL	.1	Separate waste materials for reuse and recycling.
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PART 2 - PRODUCTS

2.1 NOT USED	.1	Not Used.
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PART 3 - EXECUTION

3.1 NOT USED	.1	Not Used.
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PART 1 - GENERAL

1.1 REFERENCES

- .1 Within text of each specifications section, reference may be made to reference standards.
- .2 Conform to these reference standards, in whole or in part as specifically requested in specifications.
- .3 If there is question as to whether products or systems are in conformance with applicable standards, Departmental Representative reserves right to have such products or systems tested to prove or disprove conformance.
- .4 Cost for such testing will be born by Departmental Representative in event of conformance with Contract Documents or by Contractor in event of non-conformance.

1.2 QUALITY

- .1 Products, materials, equipment and articles incorporated in Work shall be new, not damaged or defective, and of best quality for purpose intended. If requested, furnish evidence as to type, source and quality of products provided.
 - .2 Procurement policy is to acquire, in cost effective manner, items containing highest percentage of recycled and recovered materials practicable consistent with maintaining satisfactory levels of competition. Make reasonable efforts to use recycled and recovered materials and in otherwise utilizing recycled and recovered materials in execution of work.
 - .3 Defective products, whenever identified prior to completion of Work, will be rejected, regardless of previous inspections. Inspection does not relieve responsibility, but is precaution against oversight or error. Remove and replace defective products at own expense and be responsible for delays and expenses caused by rejection.
-

1.2 QUALITY
(Cont'd)

- .4 Should disputes arise as to quality or fitness of products, decision rests strictly with Departmental Representative based upon requirements of Contract Documents.
- .5 Unless otherwise indicated in specifications, maintain uniformity of manufacture for any particular or like item throughout building.
- .6 Permanent labels, trademarks and nameplates on products are not acceptable in prominent locations, except where required for operating instructions, or when located in mechanical or electrical rooms.

1.3 STORAGE,
HANDLING AND
PROTECTION

- .1 Handle and store products in manner to prevent damage, adulteration, deterioration and soiling and in accordance with manufacturer's instructions when applicable.
 - .2 Store packaged or bundled products in original and undamaged condition with manufacturer's seal and labels intact. Do not remove from packaging or bundling until required in Work.
 - .3 Store products subject to damage from weather in weatherproof enclosures.
 - .4 Store cementitious products clear of earth or concrete floors, and away from walls.
 - .5 Keep sand, when used for grout or mortar materials, clean and dry. Store sand on wooden platforms and cover with waterproof tarpaulins during inclement weather.
 - .6 Store sheet materials, lumber and piping on flat, solid supports and keep clear of ground. Slope to shed moisture.
 - .7 Store and mix paints in heated and ventilated room. Remove oily rags and other combustible debris from site daily. Take every precaution necessary to prevent spontaneous combustion.
 - .8 Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.
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1.3 STORAGE,
HANDLING AND
PROTECTION
(Cont'd)

- .9 Touch-up damaged factory finished surfaces to Departmental Representative's satisfaction. Use touch-up materials similar to original. Do not paint over name plates.

1.4 TRANSPORTATION

- .1 Pay costs of transportation of products required in performance of Work.

1.5 MANUFACTURER'S
INSTRUCTIONS

- .1 Unless otherwise indicated in specifications, install or erect products in accordance with manufacturer's instructions. Do not rely on labels or enclosures provided with products. Obtain written instructions directly from manufacturers.
- .2 Notify Departmental Representative in writing, of conflicts between specifications and manufacturer's instructions, so that Departmental Representative will establish course of action.
- .3 Improper installation or erection of products, due to failure in complying with these requirements, authorizes Departmental Representative to require removal and re-installation at no increase in Contract Price or Contract Time.

1.6 QUALITY OF WORK

- .1 Ensure Quality of Work is of highest standard, executed by workers experienced and skilled in respective duties for which they are employed. Immediately notify Departmental Representative if required Work is such as to make it impractical to produce required results.
- .2 Do not employ anyone unskilled in their required duties. Departmental Representative reserves right to require dismissal from site, workers deemed incompetent or careless.
- .3 Decisions as to standard or fitness of Quality of Work in cases of dispute rest solely with Departmental Representative, whose decision is final.
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- 1.7 CO-ORDINATION
- .1 Ensure co-operation of workers in laying out Work. Maintain efficient and continuous supervision.
 - .2 Be responsible for coordination and placement of openings, sleeves and accessories.
- 1.8 CONCEALMENT
- .1 Before installation inform Departmental Representative if there is interference. Install as directed by Departmental Representative.
- 1.9 REMEDIAL WORK
- .1 Perform remedial work required to repair or replace parts or portions of Work identified as defective or unacceptable. Co-ordinate adjacent affected Work as required.
 - .2 Perform remedial work by specialists familiar with materials affected. Perform in a manner to neither damage nor put at risk any portion of Work.
- 1.10 FASTENINGS
- .1 Provide metal fastenings and accessories in same texture, colour and finish as adjacent materials, unless indicated otherwise.
 - .2 Prevent electrolytic action between dissimilar metals and materials.
 - .3 Use non-corrosive hot dip galvanized steel fasteners and anchors for securing exterior work, except where other material is specifically indicated on the drawings or specified.
 - .4 Space anchors within individual load limit or shear capacity and ensure they provide positive permanent anchorage. Wood, or any other organic material plugs are not acceptable.
 - .5 Keep exposed fastenings to a minimum, space evenly and install neatly.
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| <u>1.10 FASTENINGS
(Cont'd)</u> | .6 | Fastenings which cause spalling or cracking of material to which anchorage is made are not acceptable. |
| <u>1.11 FASTENINGS -
EQUIPMENT</u> | .1 | Use fastenings of standard commercial sizes and patterns with material and finish suitable for service. |
| | .2 | Use heavy hexagon heads, semi-finished unless otherwise specified. Use No. 304 stainless steel for exterior areas. |
| | .3 | Bolts may not project more than one diameter beyond nuts. |
| | .4 | Use plain type washers on equipment, sheet metal and soft gasket lock type washers where vibrations occur. Use resilient washers with stainless steel. |
| <u>1.12 PROTECTION OF
WORK IN PROGRESS</u> | .1 | Prevent overloading of parts of construction. Do not cut, drill or sleeve load bearing structural member, unless specifically indicated without written approval of Departmental Representative. |
| <u>1.13 EXISTING
UTILITIES</u> | .1 | When breaking into or connecting to existing services or utilities, execute Work at times directed by local governing authorities, with minimum of disturbance to Work, and/or building occupants. |
| | .2 | Protect, relocate or maintain existing active services. When services are encountered, cap off in manner approved by authority having jurisdiction. Stake and record location of capped service. |

PART 2 - PRODUCTS

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|---------------------|----|-----------|
| <u>2.1 NOT USED</u> | .1 | Not Used. |
|---------------------|----|-----------|
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D-200 High Pressure Air	Common Product	Section 01 61 00
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PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 SUBMITTALS

- .1 Submit to the Departmental Representative copies of the following documents, including updates issued:
 - .1 Health and Safety Program as indicated in paragraph 1.9 within seven working days of Contract Award and prior to commencement of work on the work site.
 - .2 Electronic or hard copy of Health and Safety Manual within seven working days of Contract Award and prior to commencement of work on the work site.
 - .3 A copy of the "Letter of Good Standing" from a WCB approved service provider in the province of Nova Scotia. Departmental Representative will not accept any "In Progress" or "Audit Pending" Letters from any of the service providers. Please provide letter within seven working days of Contract Award and prior to commencement of work on the work site.
 - .4 Reports or directions issued by authorities having jurisdiction, immediately upon issuance from that authority.
 - .5 Within seven working days of contract award, the successful bidder will be required to supply copies of safety training provided to all personnel who will be involved with the tender project.
 - .6 All accident or Incident Reports, within 24 hours of occurrence.
- .2 Submit other data, information and documentation upon request by the Departmental Representative as stipulated elsewhere in this section.

1.2 COMPLIANCE REQUIREMENTS

- .1 Comply with the latest edition of the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act.
 - .2 Observe and enforce construction safety measures required by:
 - .1 National Building Code of Canada (latest edition).
 - .2 Nova Scotia Provincial worker's Compensation Board.
-

1.2 COMPLIANCE .2 (Cont'd)
REQUIREMENTS .3 Halifax Regional Municipal statutes and
(Cont'd)

- .3 In event of conflict between any provisions of above authorities the most stringent provision shall apply.
- .4 Provide and maintain Worker's Compensation Board coverage for all employees for the duration of the contract. Prior to commencement of the work, at the time of Interim Completion and prior to final payment, provide to the Departmental Representative a Certificate of Clearance from the Workers' Compensation Board indicating that the Contractor's account is in good standing.

- 1.3 RESPONSIBILITY .1 The Contractor is responsible for safety of persons and property on the work site and for protection of federal employees and the general public circulating adjacent to work wire operations to extent that they may be affected by conduct of work.
- .2 The Contractor is to enforce compliance by workers and other persons granted access to work site with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with the Contractor's Health and Safety Program.
- .3 Should an unforeseen or peculiar safety related hazard or condition become evident during performance of work, immediately take measures to rectify the situation and prevent damage or harm. Advise the Departmental Representative verbally and in writing of the hazard or condition.
-

1.4 SITE CONTROL
AND ACCESS

- .1 Control all work site access points and worksite activities. Delineate and isolate the work site from adjacent and surrounding areas by use of appropriate means to maintain control of all work site access points. The contractor is advised that secured (not weighted) Modular fencing with a lockable gate is the acceptable form of delineation and isolation. The modular fencing has to be pinned to asphalt and the modular fencing must remain in place until the project is complete.
- .2 Make provisions for granting permission to access onto work site to all persons who require access. Procedures for granting permission to access are to be in accordance with the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act and the Contractor's Health and Safety Program.
- .3 Ensure persons granted access to the work site are in possession of and wear the minimum personal protective equipment (PPE) designated by the Contractor's Health and Safety Program. Ensure persons granted access to the work site are provided with, trained in the use of, and wear, appropriate PPE that are required above and beyond the designated minimums previously noted and as specifically related to the work site activity that they are involved in. Be responsible for the efficacy of the PPE that is provided above and beyond the designated minimums.
- .4 Erect signage at access points and at other strategic locations around the work site clearly identifying the work site area(s) as being "off-limits" to non-authorized persons. Signage must be professionally made with well understood graphic symbols and is not to be used as advertising but for the specific use as related to site safety and key contact information.
 - .1 Information to be provided on the signage is as follows:
 - .1 Project Name/Description:
 - .2 Contractor Company Name:
 - .3 Project Superintendent's Name/Phone No.:

- | | |
|---|--|
| 1.4 SITE CONTROL
AND ACCESS
<u>(Cont'd)</u> | .4 (Cont'd)
.1 (Cont'd)
.4 Departmental Representative Point
of Contact name/Phone No.: |
| | .5 Secure the work site at all times to protect
against un-authorized access. |
| 1.5 FILING OF
NOTICE
<u></u> | .1 The province of Nova Scotia does not require
any contractor to complete filing of a
Notice of Project with the Provincial Health
and Safety Authority. CFB Halifax,
Departmental Representative Site office will
provide a letter to the
provincial/territorial authority advising
them of the project and request any
inspection or any orders issued. |
| 1.6 PERMITS
<u></u> | .1 Obtain all permits, licenses and compliance
certificates at appropriate times and
frequencies as required by the authorities
having jurisdiction.

.2 Post all permits, licenses and compliance
certificates at the work site and provide
copies to the Departmental Representative. |
| 1.7 PROJECT/SITE
CONDITIONS
<u></u> | .1 The following are the known hazardous
substances and/or hazardous conditions at
the work site which shall be considered as
health or environmental hazards and shall be
properly managed should they be encountered
as part of the work. The following items
also outline site conditions and
requirements for the project.
.1 Ambient temperatures on the mezzanine
level of Building D200 can reach upwards of
40°C.
.2 The contractor is advised that for all
emergencies on site, they must contact the
CFB Halifax Fire Department at 902-427-3333. |
-

1.7 PROJECT/SITE
CONDITIONS
(Cont'd)

- .1 (Cont'd)
- .3 The contractor is required to have independent locates to verify any and all in slab utilities prior to any core drilling, saw cutting, water blasting and drilling into the concrete slab, concrete walls or concrete decks. The contractor shall be responsible and accountable to pay for all costs associated with the independent locates. These costs will not be passed on to Departmental Representative.
- .4 Precautions should be taken to minimize dust and exposure to dust containing silica during demolition of the structure. Workers shall wear appropriate protective clothing and respiratory equipment to minimize the exposure to dust. As well, the contractor shall implement processes to eliminate the spread of dust to areas outside the renovation area. Similar protective measures should also be employed when working in areas in and around the active construction area.
- .5 The contractor is advised that DND employees will be working in close proximity to the active worksite. The contractor shall ensure that all necessary site signage is posted, all necessary site barricades and isolation materials are in place and the Site Superintendent is present all times to ensure controls are monitored.
- .6 The contractor shall submit a traffic plan to the Departmental Representative each time traffic flow will be altered. Traffic alterations include: space restrictions, isolations and section closures. The contractor shall supply the plan at least seven (7) days prior to any alteration. This advanced notice will allow the Departmental Representative to provide the plan to the DND Fire Services, DND Military Police, DND Parking Enforcement, QHM and FMFCS.
- .2 The above lists shall not be construed as being complete and inclusive of all safety and health hazards that may be encountered as a result of Contractor's operations during the course of work. Include the above items in the hazard assessment program specified herein.

1.8 MEETINGS

- .1 Prior to commencement of work, attend a pre-commencement meeting conducted by the Departmental Representative. Ensure minimum attendance by Contractor's Site Superintendent. The Departmental Representative will advise the time, date and location of the meeting and will be responsible for recording and distributing the minutes.
- .2 Conduct site specific occupational health and safety meetings as required by the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act.
- .3 Record and post minutes of all meetings in plain view on the work site. Make copies available to the Departmental Representative upon request.

1.9 HEALTH AND SAFETY PROGRAM

- .1 Contractors are required under Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act to have in place a Health and Safety Program. Compliance requirements for the content, detail and implementation of the program resides with the provincial/territorial authority. For the purpose of this contract the Health and Safety Program shall include a site-specific Health and Safety Plan that acknowledges, assesses and addresses the hazardous substances and/or hazardous conditions known and identified in paragraph 1.7 above, and on-going hazard assessments performed during the progress of work identifying and documenting new or potential health risks and safety hazards not previously known and identified.
-

1.9 HEALTH AND
SAFETY PROGRAM
(Cont'd)

- .2 Provide one copy of the Health and Safety Program to the Departmental Representative prior to commencement of work on the work site. The copy provided to the Departmental Representative is for the purpose of review against the contract requirements related to the known hazardous substances and/or hazardous conditions. The review is not to be construed to imply approval by the Departmental Representative that the program is complete, accurate and legislatively compliant with the Nova Scotia Occupational Health and Safety Act, and the Regulations made pursuant to the Act, and shall not relieve the Contractor of their legal obligations under such legislation.

1.10 ACCIDENT
REPORTING

- .1 Investigate and report incidents and accidents as required by Nova Scotia Occupational Safety and Health Act, and the Regulations made pursuant to the Act.
- .2 For the purpose of this contract immediately investigate and provide a report to the Departmental Representative on incidents and accidents that involve:
- .1 A resulting injury that may or may not require medical aid but involves lost time at work by the injured person(s).
 - .2 Exposure to toxic chemicals or substances.
 - .3 Property damage.
 - .4 Interruption to adjacent and/or integral infrastructure operations with potential loss implications.
- .3 In the investigation and reporting of incidents and accidents, the Contractor is required to respond in a timely fashion to correct the action that was deemed to have caused the incident and/or accident and advise in writing on the action taken to prevent a re-occurrence of the incident and/or accident.

- 1.11 RECORDS ON SITE
- .1 Maintain on site a copy of the safety documentation as specified in this section and any other safety related reports and documents issued to or received from the authorities having jurisdiction.
 - .1 Hazard Assessments.
 - .2 Tool Box Talks.
 - .3 JOHS Committee Meeting minutes.
 - .4 Incident Reports.
 - .5 Accident Reports.
 - .6 Training Records.
 - .7 Site Inspection Records.
 - .8 Equipment Certifications.
 - .9 Disciplinary Records.
 - .10 WCB Letter of Clearance for all contractors on site.
 - .11 Inspections by authorities having Jurisdiction.
 - .2 Upon request, make copies available to the Departmental Representative.

PART 2 - PRODUCTS

- 2.1 NOT USED
- .1 Not used.

PART 3 - EXECUTION

- 3.1 NOT USED
- .1 Not used.

PART 1 - GENERAL

- | | | |
|------------------------|----|---|
| <u>1.1 SUBMITTALS</u> | .1 | Submittals: in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Submit written request in advance of cutting or alteration which affects: <ul style="list-style-type: none">.1 Structural integrity of elements of project..2 Integrity of weather-exposed or moisture-resistant elements..3 Efficiency, maintenance, or safety of operational elements..4 Visual qualities of sight-exposed elements..5 Work of Departmental Representative or separate contractor. |
| | .3 | Include in request: <ul style="list-style-type: none">.1 Identification of project..2 Location and description of affected Work..3 Statement on necessity for cutting or alteration..4 Description of proposed Work, and products to be used..5 Alternatives to cutting and patching..6 Effect on Work of Departmental Representative or separate contractor..7 Written permission of affected separate contractor..8 Date and time work will be executed. |
| <u>1.2 MATERIALS</u> | .1 | Required for original installation. |
| | .2 | Change in Materials: Submit request for substitution in accordance with Section 01 33 00 - Submittal Procedures. |
| <u>1.3 PREPARATION</u> | .1 | Inspect existing conditions, including elements subject to damage or movement during cutting and patching. |
| | .2 | After uncovering, inspect conditions affecting performance of Work. |
-

1.3 PREPARATION
(Cont'd)

- .3 Beginning of cutting or patching means acceptance of existing conditions.
- .4 Provide supports to assure structural integrity of surroundings; provide devices and methods to protect other portions of project from damage.
- .5 Provide protection from elements for areas which are to be exposed by uncovering work; maintain excavations free of water.

1.4 EXECUTION

- .1 Execute cutting, fitting, and patching including excavation and fill, to complete Work.
 - .2 Fit several parts together, to integrate with other Work.
 - .3 Uncover Work to install ill-timed Work.
 - .4 Remove and replace defective and non-conforming Work.
 - .5 Provide openings in non-structural elements of Work for penetrations of mechanical and electrical Work.
 - .6 Execute Work by methods to avoid damage to other Work, and which will provide proper surfaces to receive patching and finishing.
 - .7 Cut rigid materials using masonry saw or core drill. Pneumatic or impact tools not allowed on masonry work without prior approval.
 - .8 Restore work with new products in accordance with requirements of Contract Documents.
 - .9 Fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
 - .10 At penetration of fire rated wall, ceiling, or floor construction, completely seal voids with firestopping material, full thickness of the construction element.
-

1.4 EXECUTION
(Cont'd)

- .11 Refinish surfaces to be similar to adjacent finishes to satisfaction of Departmental Representative: Refinish continuous surfaces to nearest intersection. Refinish assemblies by refinishing entire unit.
- .12 Conceal pipes, ducts and wiring in floor, wall and ceiling construction of finished areas except where indicated otherwise.

1.5 WASTE
MANAGEMENT AND
DISPOSAL

- .1 Separate waste materials for reuse and recycling.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

1.1 PROJECT
CLEANLINESS

- .1 Maintain Work in tidy condition, free from accumulation of waste products and debris, other than that caused by Departmental Representative or other Contractors.
 - .2 Remove waste materials from site at daily regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
 - .3 Clear snow and ice from access to work sites, bank/pile snow in designated areas only.
 - .4 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .5 Provide on-site containers for collection of waste materials and debris.
 - .6 Provide and use marked separate bins for recycling.
 - .7 Dispose of waste materials and debris off site.
 - .8 Store volatile waste in covered metal containers, and remove from premises at end of each working day.
 - .9 Provide adequate ventilation during use of volatile or noxious substances. Use of building ventilation systems is not permitted for this purpose.
 - .10 Use only cleaning materials recommended by manufacturer of surface to be cleaned, and as recommended by cleaning material manufacturer.
 - .11 Schedule cleaning operations so that resulting dust, debris and other contaminants will not fall on wet, newly painted surfaces nor contaminate building systems.
-

- 1.2 FINAL CLEANING
- .1 When Work is Substantially Performed remove surplus products, tools, construction machinery and equipment not required for performance of remaining Work.
 - .2 Remove waste products and debris other than that caused by others, and leave Work clean and suitable for occupancy.
 - .3 Prior to final review remove surplus products, tools, construction machinery and equipment.
 - .4 Remove waste products and debris other than that caused by Departmental Representative or other Contractors.
 - .5 Remove waste materials from site at regularly scheduled times or dispose of as directed by Departmental Representative. Do not burn waste materials on site.
 - .6 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
 - .7 Broom clean and wash exterior walks, steps and surfaces; rake clean other surfaces of grounds.
 - .8 Remove dirt and other disfiguration from exterior surfaces.
 - .9 Sweep and wash clean paved areas.

- 1.3 WASTE MANAGEMENT AND DISPOSAL
- .1 Separate waste materials for reuse and recycling.

PART 2 - PRODUCTS

- 2.1 NOT USED
- .1 Not Used.

D-200 High Pressure Air	Cleaning	Section 01 74 11
Test Facility Upgrades		Page 3
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PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

1.1 DEFINITIONS

- .1 Recyclable: ability of product or material to be recovered at end of its life cycle and re-manufactured into new product for reuse.
- .2 Recycle: process by which waste and recyclable materials are transformed or collected for purpose of being transferred into new products.
- .3 Recycling: process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for purpose of using in altered form. Recycling does not include burning, incinerating, or thermally destroying waste.
- .4 Reuse: repeated use of product in same form but not necessarily for same purpose.
- .5 Salvage: removal of structural and non-structural materials from deconstruction/ disassembly projects for purpose of reuse or recycling.
- .6 Separate Condition: refers to waste sorted into individual types.
- .7 Source Separation: acts of keeping different types of waste materials separate beginning from first time they became waste.
- .8 Waste Management Co-ordinator (WMC): Contractor representative responsible for supervising waste management activities.

1.2 STORAGE, HANDLING AND PROTECTION

- .1 Store, materials to be reused, recycled and salvaged in locations as directed by Departmental Representative.
 - .2 Unless specified otherwise, materials for removal become Contractor's property.
 - .3 Protect, stockpile, store and catalogue salvaged items.
 - .4 Protect surface drainage, mechanical and electrical from damage and blockage.
-

1.2 STORAGE,
HANDLING AND
PROTECTION
(Cont'd)

- .5 Prevent contamination of materials to be salvaged and recycled and handle materials in accordance with requirements for acceptance by designated facilities.
 - .1 On-site source separation is recommended.
 - .2 Remove co-mingled materials to off-site processing facility for separation.
 - .3 Provide waybills for separated materials.
- .6 Do not store waste and debris on site for excessive time periods. Remove waste from site at regular intervals.

1.3 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Within 7 working days of contract award, submit Waste Reduction Plan for review and approval by Departmental Representative. Waste Reduction Plan describes the general management of waste and is to include but not be limited to:
 - .1 Destinations of materials listed.
 - .2 Deconstruction/disassembly techniques and sequencing.
 - .3 Schedule for deconstruction/disassembly.
 - .4 Location.
 - .5 Security.
 - .6 Protection.
 - .7 Clear labeling of storage areas.
 - .8 Details on materials handling and removal procedures.
 - .9 Quantities for materials to be salvaged for reuse or recycled and materials sent to landfill.
 - .10 Letters from receiving facilities confirming acceptance of project materials.
 - .11 Frequency of waste removals.

1.4 DISPOSAL OF
WASTES

- .1 Do not bury asphalt, C&D debris, rubbish or waste materials on-site.
 - .2 Do not dispose of waste, volatile materials, mineral spirits, oil or paint thinner into waterways, storm, or sanitary sewers.
-

1.4 DISPOSAL OF
WASTES

(Cont'd)

- .3 Keep records of construction waste including:
 - .1 Number and size of bins.
 - .2 Waste type of each bin.
 - .3 Total tonnage generated.
 - .4 Tonnage reused or recycled.
 - .5 Reused or recycled waste destination.
- .4 Dispose of waste materials in accordance with HRM By-Law S-600 and L-200.
- .5 Submit copies of all weigh bills from waste disposal facilities to Departmental Representative as work advances.

1.5 SCHEDULING

- .1 Co-ordinate Work with other activities at site to ensure timely and orderly progress of Work.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 APPLICATION

- .1 Handle waste materials not reused, salvaged, or recycled in accordance with appropriate regulations and codes.

3.2 CLEANING

- .1 Remove tools and waste materials on completion of Work, and leave work area in clean and orderly condition.
 - .2 Clean-up work are as work progresses.
 - .3 Source separate materials to be reused/ recycled into specified sort areas.
-

D-200 High Pressure Air	Construction	Section 01 74 21
Test Facility Upgrades	/Demolition Waste	Page 4
CFB Halifax Dockyard, FMFCS	Management	
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- 3.3 DIVERSION OF
MATERIALS
- .1 From following list, separate materials from general waste stream and stockpile in separate piles or containers, as reviewed by Departmental Representative, and consistent with applicable fire regulations.
 - .1 Mark containers or stockpile areas.
 - .2 Provide instruction on disposal practices.
 - .2 On-site sale of materials is permitted.

PART 1 - GENERAL

- 1.1 INSPECTION AND DECLARATION
- .1 Contractor's Inspection: Contractor and Subcontractors: conduct inspection of Work, identify deficiencies and defects, and repair as required to conform to Contract Documents.
 - .1 Notify Departmental Representative in writing of satisfactory completion of Contractor's Inspection and that corrections have been made.
 - .2 Request Departmental Representative's Inspection.
 - .2 Departmental Representative's Inspection: Departmental Representative and Contractor will perform inspection of Work to identify obvious defects or deficiencies. Contractor to correct Work accordingly.
 - .3 Completion: submit written certificate that following have been performed:
 - .1 Work has been completed and inspected for compliance with Contract Documents.
 - .2 Defects have been corrected and deficiencies have been completed.
 - .3 Equipment and systems have been tested, adjusted and balanced and are fully operational.
 - .4 Certificates required by Fire Commissioner and Utility companies have been submitted.
 - .5 Operation of systems have been demonstrated to site personnel.
 - .6 Work is complete and ready for final inspection.
 - .4 Final Inspection: when items noted above are completed, request final inspection of Work by Departmental Representative, and Contractor. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.
 - .5 Declaration of Substantial Performance: when Departmental Representative consider deficiencies and defects have been corrected and it appears requirements of Contract have been substantially performed, make application for certificate of Substantial Performance.
-

1.1 INSPECTION AND
DECLARATION
(Cont'd)

- .6 Commencement of Lien and Warranty Periods: date of Departmental Representative's acceptance of submitted declaration of Substantial Performance shall be date for commencement for warranty period and commencement of lien period unless required otherwise by lien statute of Place of Work.
- .7 Final Payment: when Departmental Representative consider final deficiencies and defects have been corrected and it appears requirements of Contract have been totally performed, make application for final payment. If Work is deemed incomplete by Departmental Representative, complete outstanding items and request reinspection.

1.2 CLEANING

- .1 In accordance with Section 01 74 11 - Cleaning.
- .2 Remove waste and surplus materials, rubbish and construction facilities from the site.

PART 2 - PRODUCTS

2.1 NOT USED

- .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED

- .1 Not Used.

PART 1 - GENERAL

1.1 SUBMITTALS

- .1 Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
- .2 Prepare instructions and data using personnel experienced in maintenance and operation of described products.
- .3 Copy will be returned after final inspection, with Departmental Representative's comments.
- .4 Revise content of documents as required prior to final submittal.
- .5 Two weeks prior to Substantial Performance of the Work, submit to the Departmental Representative, four final copies of operating and maintenance manuals in English.
- .6 Ensure spare parts, maintenance materials and special tools provided are new, undamaged or defective, and of same quality and manufacture as products provided in Work.
- .7 Furnish evidence, if requested, for type, source and quality of products provided.
- .8 Defective products will be rejected, regardless of previous inspections. Replace products at own expense.
- .9 Pay costs of transportation.

1.2 FORMAT

- .1 Organize data as instructional manual.
 - .2 Binders: vinyl, hard covered, 3 'D' ring, loose leaf 219 x 279 mm with spine and face pockets.
 - .3 When multiple binders are used correlate data into related consistent groupings. Identify contents of each binder on spine.
-

1.2 FORMAT
(Cont'd)

- .4 Cover: identify each binder with type or printed title 'Project Record Documents'; list title of project and identify subject matter of contents.
- .5 Arrange content by systems and process flow, under Section numbers and sequence of Table of Contents.
- .6 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
- .7 Text: manufacturer's printed data, or typewritten data.
- .8 Drawings: provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.
- .9 Provide 1:1 scaled CAD files in dwg format on CD.

1.3 CONTENTS - EACH
VOLUME

- .1 Table of Contents: provide title of project;
 - .1 Date of submission; names.
 - .2 Addresses, and telephone numbers of Departmental Representative and Contractor with name of responsible parties.
 - .3 Schedule of products and systems, indexed to content of volume.
 - .2 For each product or system:
 - .1 List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.
 - .3 Product Data: mark each sheet to identify specific products and component parts, and data applicable to installation; delete inapplicable information.
 - .4 Drawings: supplement product data to illustrate relations of component parts of equipment and systems, to show control and flow diagrams.
-

1.3 CONTENTS - EACH VOLUME <u>(Cont'd)</u>	.5	Typewritten Text: as required to supplement product data. Provide logical sequence of instructions for each procedure, incorporating manufacturer's instructions.
1.4 AS-BUILTS AND SAMPLES <u></u>	.1	Maintain, in addition to requirements in General Conditions, at site for Departmental Representative one record copy of: .1 Contract Drawings. .2 Specifications. .3 Addenda. .4 Change Orders and other modifications to Contract. .5 Reviewed shop drawings, product data, and samples. .6 Field test records. .7 Inspection certificates. .8 Manufacturer's certificates.
	.2	Store record documents and samples in field office apart from documents used for construction. Provide files, racks, and secure storage.
	.3	Label record documents and file in accordance with Section number listings in List of Contents of this Project Manual. Label each document "PROJECT RECORD" in neat, large, printed letters.
	.4	Maintain record documents in clean, dry and legible condition. Do not use record documents for construction purposes.
	.5	Keep record documents and samples available for inspection by Departmental Representative.
1.5 RECORDING ACTUAL SITE CONDITIONS <u></u>	.1	Record information on set of black line opaque drawings, and in copy of Project Manual, provided by Departmental Representative.
	.2	Provide felt tip marking pens, maintaining separate colours for each major system, for recording information.

1.5 RECORDING
ACTUAL SITE
CONDITIONS
(Cont'd)

- .3 Record information concurrently with construction progress. Do not conceal Work until required information is recorded.
- .4 Contract Drawings and shop drawings: mark each item to record actual construction, including:
 - .1 Field changes of dimension and detail.
 - .2 Changes made by change orders.
 - .3 Details not on original Contract Drawings.
 - .4 References to related shop drawings and modifications.
- .5 Specifications: mark each item to record actual construction, including:
 - .1 Manufacturer, trade name, and catalogue number of each product actually installed, particularly optional items and substitute items.
 - .2 Changes made by Addenda and change orders.
- .6 Other Documents: maintain manufacturer's certifications, inspection certifications, field test records, required by individual specifications sections.

1.6 EQUIPMENT AND
SYSTEMS

- .1 Each Item of Equipment and Each System: include description of unit or system, and component parts. Give function, normal operation characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and commercial number of replaceable parts.
 - .2 Operating Procedures: include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and any special operating instructions.
 - .3 Maintenance Requirements: include routine procedures and guide for trouble-shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
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| 1.6 EQUIPMENT AND
SYSTEMS
(Cont'd) | .4 | Provide servicing and lubrication schedule, and list of lubricants required. |
| | .5 | Include manufacturer's printed operation and maintenance instructions. |
| | .6 | Provide original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance. |
| | .7 | Provide Contractor's co-ordination drawings, with installed colour coded piping diagrams. |
| | .8 | Provide charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams. |
| | .9 | Provide list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage. |
| | .10 | Include test and balancing reports and specified in Section 01 91 13 - General Commissioning (Cx) Requirements. |
| | .11 | Additional requirements: as specified in individual specification sections. |
| 1.7 MATERIALS AND
FINISHES | .1 | Building Products, Applied Materials, and Finishes: include product data, with catalogue number, size, composition, and colour and texture designations. Provide information for re-ordering custom manufactured products. |
| | .2 | Instructions for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance. |
| | .3 | Moisture-Protection and Weather-Exposed Products: include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance. |
| | .4 | Additional Requirements: as specified in individual specifications sections. |

- 1.8 SPARE PARTS
- .1 Provide spare parts, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to location as directed by Departmental Representative; place and store.
 - .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.

- 1.9 MAINTENANCE MATERIALS
- .1 Provide maintenance and extra materials, in quantities specified in individual specification sections.
 - .2 Provide items of same manufacture and quality as items in Work.
 - .3 Deliver to location as directed by Departmental Representative; place and store.
 - .4 Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
 - .5 Obtain receipt for delivered products and submit prior to final payment.

- 1.10 SPECIAL TOOLS
- .1 Provide special tools, in quantities specified in individual specification section.
 - .2 Provide items with tags identifying their associated function and equipment.
 - .3 Deliver to location as directed by Departmental Representative; place and store.
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<u>1.10 SPECIAL TOOLS (Cont'd)</u>	.4	Receive and catalogue items. Submit inventory listing to Departmental Representative. Include approved listings in Maintenance Manual.
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<u>1.11 STORAGE, HANDLING AND PROTECTION</u>	.1	Store spare parts, maintenance materials, and special tools in manner to prevent damage or deterioration.
	.2	Store in original and undamaged condition with manufacturer's seal and labels intact.
	.3	Store components subject to damage from weather in weatherproof enclosures.
	.4	Store paints and freezable materials in a heated and ventilated room.
	.5	Remove and replace damaged products at own expense and to satisfaction of Departmental Representative.

<u>1.12 WARRANTIES AND BONDS</u>	.1	Develop warranty management plan to contain information relevant to Warranties.
	.2	Submit warranty management plan, 30 days before planned pre-warranty conference, to Departmental Representative approval.
	.3	Warranty management plan to include required actions and documents to assure that Departmental Representative receives warranties to which it is entitled.
	.4	Provide plan in narrative form and contain sufficient detail to make it suitable for use by future maintenance and repair personnel.
	.5	Submit, warranty information made available during construction phase, to Departmental Representative for approval prior to each monthly pay estimate.
	.6	Assemble approved information in binder and submit upon acceptance of work. Organize binder as follows:

1.12 WARRANTIES AND .6
BONDS
(Cont'd)

(Cont'd)

- .1 Separate each warranty or bond with index tab sheets keyed to Table of Contents listing.
- .2 List subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.
- .3 Obtain warranties and bonds, executed in duplicate by subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.
- .4 Verify that documents are in proper form, contain full information, and are notarized.
- .5 Co-execute submittals when required.
- .6 Retain warranties and bonds until time specified for submittal.
- .7 Except for items put into use with Departmental Representative's permission, leave date of beginning of time of warranty until Date of Substantial Performance is determined.
- .8 Conduct joint 4 month and 9 month warranty inspection, measured from time of acceptance, by Departmental Representative.
- .9 Include information contained in warranty management plan as follows:
 - .1 Roles and responsibilities of personnel associated with warranty process, including points of contact and telephone numbers within the organizations of Contractors, subcontractors, manufacturers or suppliers involved.
 - .2 Provide list for each warranted equipment, item, feature of construction or system indicating:
 - .1 Name of item.
 - .2 Model and serial numbers.
 - .3 Location where installed.
 - .4 Name and phone numbers of manufacturers or suppliers.
 - .5 Names, addresses and telephone numbers of sources of spare parts.
 - .6 Warranties and terms of warranty: include one-year overall warranty of construction. Indicate items that have extended warranties and show separate warranty expiration dates.
 - .7 Cross-reference to warranty certificates as applicable.

- 1.12 WARRANTIES AND BONDS (Cont'd)
- .9 (Cont'd)
- .2 (Cont'd)
- .8 Starting point and duration of warranty period.
- .9 Summary of maintenance procedures required to continue warranty in force.
- .10 Cross-Reference to specific pertinent Operation and Maintenance manuals.
- .11 Organization, names and phone numbers of persons to call for warranty service.
- .12 Typical response time and repair time expected for various warranted equipment.
- .3 Contractor's plans for attendance at 4 and 9 month post-construction warranty inspections.
- .4 Procedure and status of tagging of equipment covered by extended warranties.
- .5 Post copies of instructions near selected pieces of equipment where operation is critical for warranty and/or safety reasons.
- .10 Respond in a timely manner to oral or written notification of required construction warranty repair work.
- .11 Written verification will follow oral instructions. Failure to respond will be cause for the Departmental Representative to proceed with action against Contractor.
- 1.13 PRE-WARRANTY CONFERENCE
- .1 Meet with Departmental Representative, to develop understanding of requirements of this section. Schedule meeting prior to contract completion, and at time designated by Departmental Representative.
- .2 Departmental Representative will establish communication procedures for:
- .1 Notification of construction warranty defects.
- .2 Determine priorities for type of defect.
- .3 Determine reasonable time for response.
-

1.13 PRE-WARRANTY .3 Provide name, telephone number and address
CONFERENCE of licensed and bonded company that is
(Cont'd) authorized to initiate and pursue
construction warranty work action.

.4 Ensure contact is located within local
service area of warranted construction, is
continuously available, and is responsive to
inquiries for warranty work action.

1.14 WARRANTY TAGS .1 Tag, at time of installation, each warranted
item. Provide durable, oil and water
resistant tag approved by Departmental
Representative.

.2 Attach tags with copper wire and spray with
waterproof silicone coating.

.3 Leave date of acceptance until project is
accepted for occupancy.

.4 Indicate following information on tag:
.1 Type of product/material.
.2 Model number.
.3 Serial number.
.4 Contract number.
.5 Warranty period.
.6 Inspector's signature.
.7 Construction Contractor.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

PART 1 - GENERAL

- 1.1 SUMMARY
- .1 Section Includes:
 - .1 General requirements relating to commissioning of project's components and systems, specifying general requirements to PV of components, equipment, sub-systems, systems, and integrated systems.
 - .2 Acronyms:
 - .1 AFD - Alternate Forms of Delivery, service provider.
 - .2 BMM - Building Management Manual.
 - .3 Cx - Commissioning.
 - .4 EMCS - Energy Monitoring and Control Systems.
 - .5 O&M - Operation and Maintenance.
 - .6 PI - Product Information.
 - .7 PV - Performance Verification.
 - .8 TAB - Testing, Adjusting and Balancing.
- 1.2 GENERAL
- .1 Cx is a planned program of tests, procedures and checks carried out systematically on systems and integrated systems of the finished Project. Cx is performed after systems and integrated systems are completely installed, functional and Contractor's Performance Verification responsibilities have been completed and approved. Objectives:
 - .1 Verify installed equipment, systems and integrated systems operate in accordance with contract documents and design criteria and intent.
 - .2 Ensure appropriate documentation is compiled into the BMM/O&M manuals.
 - .3 Effectively train O&M staff.
 - .2 Contractor assists in Cx process, operating equipment and systems, troubleshooting and making adjustments as required.
 - .1 Systems to be operated at full capacity under various modes to determine if they function correctly and consistently at peak efficiency. Systems to be interactively with each other as intended in accordance with Contract Documents and design criteria.
-

- | | | |
|---|----|--|
| 1.2 GENERAL
(Cont'd) | .2 | (Cont'd)
.2 During these checks, adjustments to be made to enhance performance to meet environmental or user requirements. |
| | .3 | Design Criteria: as per Departmental Representative's requirements or determined by Departmental Representative. To meet Project functional and operational requirements. |
| 1.3 COMMISSIONING
OVERVIEW | .1 | Cx to be a line item of Contractor's cost breakdown. |
| | .2 | Cx activities supplement field quality and testing procedures described in relevant technical sections. |
| | .3 | Cx is conducted in concert with activities performed during stage of project delivery. Cx identifies issues in Planning and Design stages which are addressed during Construction and Cx stages to ensure the built facility is constructed and proven to operate satisfactorily under weather, environmental and occupancy conditions to meet functional and operational requirements. Cx activities includes transfer of critical knowledge to facility operational personnel. |
| | .4 | Departmental Representative will issue Interim Acceptance Certificate when:
.1 Completed Cx documentation has been received, reviewed for suitability and approved by Departmental Representative.
.2 Equipment, components and systems have been commissioned.
.3 O&M training has been completed. |
| 1.4 NON-CONFORMANCE
TO PERFORMANCE
VERIFICATION
REQUIREMENTS | .1 | Should equipment, system components, and associated controls be incorrectly installed or malfunction during Cx, correct deficiencies, re-verify equipment and components within the unfunctional system, including related systems as deemed required by Departmental Representative, to ensure effective performance. |
-

1.4 NON-CONFORMANCE TO PERFORMANCE VERIFICATION REQUIREMENTS
(Cont'd)

.2 Costs for corrective work, additional tests, inspections, to determine acceptability and proper performance of such items to be borne by Contractor. Above costs to be in form of progress payment reductions or hold-back assessments.

1.5 PRE-CX REVIEW

.1 Before Construction:

.1 Review contract documents, confirm by writing to Departmental Representative.

.1 Adequacy of provisions for Cx.

.2 Aspects of design and installation pertinent to success of Cx.

.2 During Construction:

.1 Co-ordinate provision, location and installation of provisions for Cx.

.3 Before start of Cx:

.1 Have completed Cx Plan up-to-date.

.2 Ensure installation of related components, equipment, sub-systems, systems is complete.

.3 Fully understand Cx requirements and procedures.

.4 Have Cx documentation shelf-ready.

.5 Understand completely design criteria and intent and special features.

.6 Submit complete start-up documentation to Departmental Representative.

.7 Have Cx schedules up-to-date.

.8 Ensure systems have been cleaned thoroughly.

.9 Complete TAB procedures on systems, submit TAB reports to Departmental Representative for review and approval.

.10 Ensure "As-Built" system schematics are available.

.4 Inform Departmental Representative in writing of discrepancies and deficiencies on finished works.

1.6 CONFLICTS

.1 Report conflicts between requirements of this section and other sections to Departmental Representative before start-up and obtain clarification.

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|--|----|---|
| <u>1.6 CONFLICTS
(Cont'd)</u> | .2 | Failure to report conflict and obtain clarification will result in application of most stringent requirement. |
| <u>1.7 SUBMITTALS</u> | .1 | Submittals: in accordance with Section 01 33 00 - Submittal Procedures.
.1 Submit no later than 4 weeks after award of Contract:
.1 Name of Contractor's Cx agent.
.2 Draft Cx documentation.
.3 Preliminary Cx schedule.
.2 Request in writing to Departmental Representative for changes to submittals and obtain written approval at least 8 weeks prior to start of Cx.
.3 Submit proposed Cx procedures to Departmental Representative where not specified and obtain written approval at least 8 weeks prior to start of Cx.
.4 Provide additional documentation relating to Cx process required by Departmental Representative. |
| <u>1.8 COMMISSIONING
DOCUMENTATION</u> | .1 | Departmental Representative to review and approve Cx documentation. |
| | .2 | Provide completed and approved Cx documentation to Departmental Representative. |
| <u>1.9 COMMISSIONING
SCHEDULE</u> | .1 | Provide detailed Cx schedule. |
| | .2 | Provide adequate time for Cx activities prescribed in technical sections and commissioning sections including:
.1 Approval of Cx reports.
.2 Verification of reported results.
.3 Repairs, retesting, re-commissioning, re-verification.
.4 Training. |
| <u>1.10 COMMISSIONING
MEETINGS</u> | .1 | Convene Cx meetings following project meetings. |
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1.10 COMMISSIONING MEETINGS
(Cont'd)

- .2 Purpose: to resolve issues, monitor progress, identify deficiencies, relating to Cx.
- .3 Continue Cx meetings on regular basis until commissioning deliverables have been addressed.
- .4 At 60 % construction completion stage, Departmental Representative to call a separate Cx scope meeting to review progress, discuss schedule of equipment start-up activities and prepare for Cx. Issues at meeting to include:
 - .1 Review duties and responsibilities of Contractor and subcontractors, addressing delays and potential problems.
 - .2 Determine the degree of involvement of trades and manufacturer's representatives in the commissioning process.
- .5 Thereafter Cx meetings to be held until project completion and as required during equipment start-up and functional testing period.
- .6 Meeting will be chaired by Departmental Representative, who will record and distribute minutes.
- .7 Ensure subcontractors and relevant manufacturer representatives are present at 60% and subsequent Cx meetings and as required.

1.11 STARTING AND TESTING
TESTING

- .1 Contractor assumes liabilities and costs for inspections. Including disassembly and re-assembly after approval, starting, testing and adjusting, including supply of testing equipment.

1.12 WITNESSING OF STARTING AND TESTING
TESTING

- .1 Provide 14 days notice prior to commencement.
 - .2 Departmental Representative to witness of start-up and testing.
-

1.12 WITNESSING OF .3 Contractor's Cx Agent to be present at tests
STARTING AND performed and documented by sub-trades,
TESTING suppliers and equipment manufacturers.
(Cont'd)

1.13 MANUFACTURER'S .1 Factory testing: manufacturer to:
INVOLVEMENT .1 Coordinate time and location of
testing.
.2 Provide testing documentation for
approval by Departmental Representative.
.3 Arrange for Departmental Representative
to witness tests.
.4 Obtain written approval of test results
and documentation from Departmental
Representative before delivery to site.
.2 Obtain manufacturers installation, start-up
and operations instructions prior to
start-up of components, equipment and
systems and review with Departmental
Representative.
.1 Compare completed installation with
manufacturer's published data, record
discrepancies, and review with manufacturer.
.2 Modify procedures detrimental to
equipment performance and review same with
manufacturer before start-up.
.3 Integrity of warranties:
.1 Use manufacturer's trained start-up
personnel where specified elsewhere in other
divisions or required to maintain integrity
of warranty.
.2 Verify with manufacturer that testing
as specified will not void warranties.
.4 Qualifications of manufacturer's personnel:
.1 Experienced in design, installation and
operation of equipment and systems.
.2 Ability to interpret test results
accurately.
.3 To report results in clear, concise,
logical manner.

1.14 PROCEDURES .1 Verify that equipment and systems are
complete, clean, and operating in normal and
safe manner prior to conducting start-up,
testing and Cx.

1.14 PROCEDURES
(Cont'd)

- .2 Conduct start-up and testing in following distinct phases:
 - .1 Included in delivery and installation:
 - .1 Verification of conformity to specification, approved shop drawings and completion of PI report forms.
 - .2 Visual inspection of quality of installation.
 - .2 Start-up: follow accepted start-up procedures.
 - .3 Operational testing: document equipment performance.
 - .4 System PV: include repetition of tests after correcting deficiencies.
 - .5 Post-substantial performance verification: to include fine-tuning.
- .3 Correct deficiencies and obtain approval from Departmental Representative after distinct phases have been completed and before commencing next phase.
- .4 Document required tests on approved PV forms.
- .5 Failure to follow accepted start-up procedures will result in re-evaluation of equipment by an independent testing agency selected by Departmental Representative. If results reveal that equipment start-up was not in accordance with requirements, and resulted in damage to equipment, implement following:
 - .1 Minor equipment/systems: implement corrective measures approved by Departmental Representative at contractor's expense.
 - .2 Major equipment/systems: if evaluation report concludes that damage is minor, implement corrective measures approved by Departmental Representative at contractor's expense.
 - .3 If evaluation report concludes that major damage has occurred, Departmental Representative shall reject equipment.
 - .1 Rejected equipment to be remove from site and replace with new at contractor's expense.
 - .2 Subject new equipment/systems to specified start-up procedures.

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| <u>1.15 START-UP
DOCUMENTATION</u> | .1 | Assemble start-up documentation and submit to Departmental Representative for approval before commencement of commissioning. |
| | .2 | Start-up documentation to include: <ul style="list-style-type: none">.1 Factory and on-site test certificates for specified equipment..2 Pre-start-up inspection reports..3 Signed installation/start-up check lists..4 Start-up reports,.5 Step-by-step description of complete start-up procedures, to permit Departmental Representative to repeat start-up at any time. |
| <u>1.16 OPERATION AND
MAINTENANCE OF
EQUIPMENT AND
SYSTEMS</u> | .1 | After start-up, operate and maintain equipment and systems as directed by equipment/system manufacturer. |
| | .2 | With assistance of manufacturer develop written maintenance program and submit to Departmental Representative for approval before implementation. |
| | .3 | Operate and maintain systems for length of time required for commissioning to be completed. |
| | .4 | After completion of commissioning, operate and maintain systems until issuance of certificate of interim acceptance. |
| <u>1.17 TEST RESULTS</u> | .1 | If start-up, testing and/or PV produce unacceptable results, repair, replace or repeat specified starting and/or PV procedures until acceptable results are achieved. |
| | .2 | Provide manpower and materials, assume costs for re-commissioning. |
| <u>1.18 START OF
COMMISSIONING</u> | .1 | Notify Departmental Representative at least 21 days prior to start of Cx. |
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<u>1.18 START OF COMMISSIONING (Cont'd)</u>	.2	Start Cx after elements of building affecting start-up and performance verification of systems have been completed.
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<u>1.19 INSTRUMENTS / EQUIPMENT</u>	.1	Submit to Departmental Representative for review and approval: .1 Complete list of instruments proposed to be used. .2 Listed data including, serial number, current calibration certificate, calibration date, calibration expiry date and calibration accuracy.
	.2	Provide the following equipment as required: .1 2-way radios. .2 Ladders. .3 Equipment as required to complete work.

<u>1.20 COMMISSIONING PERFORMANCE VERIFICATION</u>	.1	Carry out Cx: .1 Under actual operating conditions, over entire operating range, in all modes. .2 On independent systems and interacting systems.
	.2	Cx procedures to be repeatable and reported results are to be verifiable.
	.3	Follow equipment manufacturer's operating instructions.

<u>1.21 WITNESSING COMMISSIONING</u>	.1	Departmental Representative to witness activities and verify results.
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<u>1.22 AUTHORITIES HAVING JURISDICTION</u>	.1	Where specified start-up, testing or commissioning procedures duplicate verification requirements of authority having jurisdiction, arrange for authority to witness procedures so as to avoid duplication of tests and to facilitate expedient acceptance of facility.
	.2	Obtain certificates of approval, acceptance and compliance with rules and regulation of authority having jurisdiction.

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|--|----|---|
| <u>1.22 AUTHORITIES
HAVING JURISDICTION
(Cont'd)</u> | .3 | Provide copies to Departmental Representative within 5 days of test and with Cx report. |
| <u>1.23 COMMISSIONING
CONSTRAINTS</u> | .1 | Since access into secure or sensitive areas will be very difficult after occupancy it is necessary to complete Cx of occupancy, weather, and seasonal sensitive equipment and systems in these areas before issuance of the Interim Certificate, using, if necessary, simulated thermal loads. |
| <u>1.24 EXTRAPOLATION
OF RESULTS</u> | .1 | Where Cx of weather, occupancy, or seasonal-sensitive equipment or systems cannot be conducted under near-rated or near-design conditions, extrapolate part-load results to design conditions when approved by Departmental Representative in accordance with equipment manufacturer's instructions, using manufacturer's data, with manufacturer's assistance and using approved formulae. |
| <u>1.25 EXTENT OF
VERIFICATION</u> | .1 | Provide manpower and instrumentation to verify up to 30 % of reported results, unless specified otherwise in other sections. |
| | .2 | Number and location to be at discretion of Departmental Representative. |
| | .3 | Conduct tests repeated during verification under same conditions as original tests, using same test equipment, instrumentation. |
| | .4 | Review and repeat commissioning of systems if inconsistencies found in more than 20 % of reported results. |
| | .5 | Perform additional commissioning until results are acceptable to Departmental Representative. |
-

- 1.26 REPEAT VERIFICATIONS
- .1 Assume costs incurred by Departmental Representative for third and subsequent verifications where:
 - .1 Verification of reported results fail to receive Departmental Representative's approval.
 - .2 Repetition of second verification again fails to receive approval.
 - .3 Departmental Representative deems Contractor's request for second verification was premature.
- 1.27 SUNDRY CHECKS AND ADJUSTMENTS
- .1 Make adjustments and changes which become apparent as Cx proceeds.
 - .2 Perform static and operational checks as applicable and as required.
- 1.28 DEFICIENCIES, FAULTS, DEFECTS
- .1 Correct deficiencies found during start-up and Cx to satisfaction of Departmental Representative.
 - .2 Report problems, faults or defects affecting Cx to Departmental Representative in writing. Stop Cx until problems are rectified. Proceed with written approval from Departmental Representative.
- 1.29 COMPLETION OF COMMISSIONING
- .1 Upon completion of Cx leave systems in normal operating mode.
 - .2 Except for warranty and seasonal verification activities specified in Cx specifications, complete Cx prior to issuance of Interim Certificate of Completion.
 - .3 Cx to be considered complete when contract Cx deliverables have been submitted and accepted by Departmental Representative.
- 1.30 ACTIVITIES UPON COMPLETION OF COMMISSIONING
- .1 When changes are made to baseline components or system settings established during Cx process, provide updated Cx form for affected item.
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<u>1.31 MAINTENANCE MATERIALS, SPARE PARTS, SPECIAL TOOLS</u>	.1	Supply, deliver, and document maintenance materials, spare parts, and special tools as specified in contract.
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<u>1.32 OCCUPANCY</u>	.1	Cooperate fully with Departmental Representative during stages of acceptance and occupancy of facility.
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<u>1.33 INSTALLED INSTRUMENTATION</u>	.1	Use instruments installed under Contract for TAB and PV if: .1 Accuracy complies with these specifications. .2 Calibration certificates have been deposited with Departmental Representative.
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<u>1.34 PERFORMANCE VERIFICATION TOLERANCES</u>	.1	Application tolerances: .1 Specified range of acceptable deviations of measured values from specified values or specified design criteria. Except for special areas, to be within +/- 10 % of specified values.
	.2	Instrument accuracy tolerances: .1 To be of higher order of magnitude than equipment or system being tested.
	.3	Measurement tolerances during verification: .1 Unless otherwise specified actual values to be within +/- 2 % of recorded values.

<u>1.35 DEPARTMENTAL REPRESENTATIVE'S PERFORMANCE TESTING</u>	.1	Performance testing of equipment or system by Departmental Representative will not relieve Contractor from compliance with specified start-up and testing procedures.
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PART 2 - PRODUCTS

<u>2.1 NOT USED</u>	.1	Not Used.
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PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.