FORT GEORGE

NIAGARA NATIONAL HISTORIC SITES

LANDSCAPE LIGHTING

TABLE OF CONTENTS

1 General	.1	This Section covers items common to Sections of Division 16. This section supplements requirements of Division 1.
2 Codes and Standards	.1	Do complete installation in accordance with CSA C22.1 except where specified otherwise.
	.2	Do overhead and underground systems in accordance with CSA C22.3No.1-M1 except where specified otherwise.
	.3	Abbreviations for electrical terms: to CSA Z85.
3 Care, Operation and Start-up	.1	Instruct Consultant and operating personnel in the operation, care and maintenance of equipment.
	.2	Arrange and pay for services of manufacturer's factory service engineer to supervise start-up of installation, check, adjust, balance and calibrate components.
	.3	Provide these services for such period, and for as many visits as necessary to put equipment in operation, and ensure that operating personnel are conversant with all aspects of its care and operation.
4 Voltage Ratings	.1	Operating voltages: to CAN3-C235.
5 Permits, Fees and Inspection	.1	Submit to Electrical Safety Authority and Hydro Utility Company necessary number of drawings and specifications for examination and approval prior to commencement of work.
	.2	Pay associated fees.
	.3	Consultant will provide drawings and specifications required at no cost.
	.4	Notify Consultant of changes required by Electrical Safety Authority prior to making changes.
	.5	Furnish Certificates of Acceptance from Electrical Safety Authority on completion of work to Consultant.

6 Materials and Equipment

.1 Equipment and material to be CSA certified. Where there is no alternative to supplying equipment which is not CSA certified, obtain special approval from Electrical Safety Authority.

.2 Factory assemble control panels and component assemblies.

7 Wiring Identification

.1 Identify wiring with permanent indelible identifying markings, either numbered or coloured plastic tapes, on both ends of phase conductors of feeders and branch circuit wiring.

.2 Maintain phase sequence and colour coding throughout.

.3 Colour code: to CSA C22.1.

.4 Use colour coded wires in communication cables, matched throughout system.

8 Wiring Terminations

.1 Lugs, terminals, screws used for termination of wiring to be suitable for either copper or aluminum conductors.

9 Manufacturers and CSA Labels

.1 Visible and legible after equipment is installed.

10 Warning Signs

.1 As specified and to meet requirements of Electrical Safety Authority and Consultant.

11 Location of Dimmers

.1 Locate outlets in accordance with Ontario Electrical Safety Code

.2 Do not install outlets back-to-back in wall; allow minimum 150 mm horizontal clearance between boxes.

.3 Change location of outlets at no extra cost or credit, providing distance does not exceed 3000 mm, and information is given before installation.

.4 Locate dimmers on latch side of doors. Locate disconnect devices in mechanical and elevator machine rooms on latch side of floor.

12 Load Balance

.1 Measure phase current to panelboards with normal loads operating at time of acceptance. Adjust branch circuit connections as required to obtain best balance of current between phases and record changes.

.2 Measure phase voltages at loads and adjust transformer taps to within 2% of rated voltage of equipment, as feasible.

.3 Submit, at completion of work, report listing phase and neutral currents on panelboards, dry-core transformers and motor control centres, operating under normal load. State hour and date on which each load was measured, and voltage at time of test.

13 Conduit and Installation

.1 Install external conduit level and plumb using rated hardware

.2 For external EMT use only compression fittings. All other types of fittings will be disallowed.

.3 Avoid drilling in external walls as much as possible. Weather –seal all resulting penetrations.

14 Field Quality Control

.1 Conduct and pay for following tests:

.1 Power distribution system including phasing, voltage, grounding and load balancing.
.2 Circuits originating from branch distribution panels.
.3 Lighting and its control.

.2 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.

.3 Insulation resistance testing.

.1 Megger circuits, feeders and equipment with a 500 V
.4 Check resistance to ground before energizing.

.4 Provide instruments, meters, equipment and personnel required to conduct tests during and at conclusion of project.

.5 Submit test results for Consultant's review and acceptance.

15 Co-ordination of Protective Devices

.1 Ensure circuit protective devices such as overcurrent trips, relays and fuses are installed to required values and settings.

PART 1 - GENERAL

1.1 References

.1 Canadian Standards Association (CSA)

- .1 CAN/ CSA C22.2. No.18, Outlet Boxes, Conduct Boxes and Fittings.
- .2 CSA CSS.2 No. 45-M Rigid Metal Conduit.
- .3 CSA C22.2 No. 56 Flexible Metal Conduit and Liquid-Tight Flexible Metal Conduit.
- .4 CSA C22.2 No. 83 Electrical Metallic Tubing.
- .5 CSA C22.2 No.211.2 Rigid PVC (Unplasticized) Conduit.

1.2 Location of Conduit

.1 Drawings do not indicate all conduit runs. Those indicated are in diagrammatic form only.

PART 2 - PRODUCTS

2.1 Conduits

.1 Hot dipped galvanized electrical metallic tubing (EMT) for all indoor use.

.2 Rigid PVC with thermal expansion joints for outdoor use.

.3 Flexible steel liquid-tight conduit for all local disconnect-to-motor and field instrumentation connections.

.4 Rigid PVC conduit: to CSA C22.2 No.211.2.

.5 Flexible metal conduit: to CSA C22.2 No.56

.6 Flexible PVC conduit: to CAN/CSA C22.2 No.227.3

2.2 Conduit Fastenings

.1 One hole steel straps to secure surface conduits NPS 2 and smaller.

.2 Beam clamps to secure conduits to exposed steel work.

.3 Channel type supports for two or more conduits at 1.5 m oc.

.4 Galvanized steel threaded rods, 6 mm dia. to support suspended conduit and channels.

2.3 Conduit Fittings

.1 Fittings: manufactured for use with conduit specified. Material & finish: same as conduit.

.2 For EMT conduit only compression fittings are acceptable. All others will be rejected.

.3 Factory "ells" where 90° bends are required for NPS 3/4 and larger conduits.

2.4 Boxes

.1 Cast aluminum boxes and metal covers with gaskets and compression fittings for EMT conduit.

2.5 Fish Cord

.1 Polypropylene.

PART 3 - EXECUTION

3.1 Installation

.1 Install conduits to minimise visibility in exposed locations and cause minimum interference with heritage nature of the buildings.

.2 Use electrical metallic tubing (EMT) except where specified otherwise.

.3 X-ray all floors and concrete walls before drilling penetrations.

.4 For the outdoor EMT use only cast aluminum boxes.

.5 Group conduit runs where feasible.

.6 Minimum conduit size: NPS 1/2.

.7 Mechanically bend metal conduit cold. Replace conduit if kinked or flattened more than 1/10-th of its original diameter.

.8 Field threads on rigid conduit must be of sufficient length to draw conduits up tight.

.9 Install fish cord in empty conduits.

.10 Where conduits become blocked, remove and replace blocked section. Do not use liquids to clean out conduits.

.11 Deburr, dry and clean out all conduits before installing wire.

.12 Fire-seal all conduit penetrations in fire rated floors and walls.

.13 Water-seal all conduit penetrations in outside walls.

.14 In attic space, use PVC conduits with thermal expansion joints. Support conduits on concrete sleeper tiles.

3.2 Surface Conduits

.1 Run parallel or perpendicular to building lines.

.2 Run conduits in flanged portion of structural steel.

.3 Group conduits wherever possible.

.4 Do not pass conduits through structural members.

PART 1 - GENERAL

1.2 Related Sections .1 Electrical General Requirements Section 16010.

1.3 Product Data .1 Submit product data in accordance with Section 01300 – Submittals.

PART 2 - PRODUCTS

2.1 Luminaires .1 Contemporary LED fixture with:

.1 Housing: die-cast aluminum weatherproof enclosure.

.2 Mounting base: integral with the post or bollard..

.3 Electrical rating: 120V, 30W, 0.9 PF or better.

.4 Lamp type: LED with integral driver.

.5 Lens: integral to LED bars. Sealed to IP66 ratting.

.6 Light Distribution: Type T4FT for parking and T4W for walkway.

.7 Colour rendition: CCT Index 3500K at 70 CRI.

.8 Life span: 50,000 hours or better for LED and driver.

.9 Lumen depreciation: less than 70% over 50,000 hours.

.10 Integral surge protection: 10kV transient voltage.

.11 LED bars and driver removable without tools.

.12 Operating ambiance: - 20°C to + 40°C.

.13 Finish: powder coated black.

.14 Acceptable products: SOLERA SRB8-T-E-TP-BL, or approved equal.

.15 Warranty: 5 calendar years, 50,000 hours.

2.2 Lighting Poles

.1 Steel poles: designed for underground wiring and:

.1 Suitable for base-top installation.

.2 Style: steel tube, 200 mm I.D. x 3 mm.

.3 Length: 3.0 m.

.4 Luminaire Installation: pole-top, press-fit & secure.

.5 Access handhole for wiring connections and fuses, with welded-on reinforcing frame and bolted-on cover with stainless steel tamper proof screws.

.6 Finish: hot dipped galvanized after fabrication, and powder coated black.

.7 Grounding lugs for grounding rod and conductor.

.8 Fusing: 5A, 250V OTM type with rubber boot.

2.3 Grounding

.1 Grounding electrodes at end of each lighting string and:

.1 Grounding rods: steel copper clad 19 mm dia., 3 m long.

.2 Grounding conductor: bare stranded copper.

2.4 Ducts

.1 Rigid PVC ducts type DBII in trench.

.2 Flex PVC duct matching type and size for entry to lighting poles.

2.5 Wiring

.1 Wiring in duct: AWG 10 RWU 90Cu, live, neutral and ground conductor in each duct.

.2 Wiring in poles: AWG 12 RW90 Cu.

2.6 Lighting Control

.1 Central photocell and contactors for entire area.

.2 Central 365-day timer-clock.

.3 Dedicated circuit breaker panel in existing panels.

PART 3 - EXECUTION

3.1 Photometric Models

.1 Prior to placing orders, submit for Lighting Designer's approval a photometric model of proposed luminaires prepared by the luminaire manufacturer.

.2 Expected results are:

.1 Average horizontal and vertical illuminance: 10 lux on the parking and walkways .

.2 Average horizontal illuminance: 3.3 lux or better for 3 m either side of the pathway.

.3 Uniformity ratio: Max/Min of 10:1 Avg/Min of 4:1, or better.

.4 Glare: 40%, or better.

.5 Light loss factor: 0.7.

.3 Place luminaire orders only after Lighting Designer's approval.

3.2 Installation

.1 Stake out proposed locations of poles and bollards and obtain Lighting Designer's approval before proceeding.

.2 Pour reinforced concrete bases ad set in anchored bolts. Set base tops flush with grade.

.3 Install poles and bollards true and plumb, in accordance with manufacturer's instructions. Set for luminaire mounting height 3.86 m for poles and 0.90m for bollards.

.4 Install grounding rods at end poles and bollards and connect to ground lug.

.5 Install ducts and wiring in trenches.

.6 Install luminaires on poles and secure with screws.

.7 Check luminaire orientation, level and tilt.

.8 Connect luminaires to lighting circuit.

.9 Perform tests in accordance with Section 16010 - Electrical General Requirements.

.10 Energize circuits and program the clock.

PART 1 – GENERAL

1.1 Submittals

.1 Submit to Departmental Representative copies of the following documents, including updates:
- .1 Site Specific Health and Safety Plan.
- .2 Name and qualifications of person to be retained full time as H&S Co-ordinator.

1.2 Compliance Requirements

.1 Comply with the Occupational Health and Safety Act for the Province of Newfoundland and Labrador, and the Occupational Health and Safety Act Regulations made pursuant to the Act.

.2 Comply with Canada Labour Code Part II, and the Canada Occupational Safety and Health Regulations made under Part II of the Canada Labour Code.

.3 Observe and enforce construction safety measures required by:
- .1 National Building Code of Canada;
- .2 Provincial Worker's Compensation Board;
- .3 Municipal statutes and ordinances.

.4 In event of conflict between any provisions of above authorities the most stringent provision will apply. Should a dispute arise in determining the most stringent requirement, Departmental Representative will advise on the course of action to be followed.

.5 A copy of the Canada Labour Code Part II may be obtained by contacting:

Canadian Government Publishing
Public Works & Government Services Canada
Ottawa, Ontario, K1A 0S9
Tel: (819) 956-4800 (1-800-635-7943)
Publication No. L31-85/2000 E or F)

.6 Maintain Workers Compensation Coverage for duration of Contract. Submit Letter of Good Standing to Departmental Representative upon request.

1.3 Responsibility

.1 Be responsible for health and safety of persons on site, of property and for protection of persons and public circulating adjacent to work operations to extent that they may be affected by conduct of the Work.

.2 Enforce compliance by all workers, sub-contractors 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 site-specific Health and Safety Plan.

1.4 Site Control and Access

.1 Control work site and entry points to construction areas.
.1 Delineate and isolate construction areas from other areas of site Facility by use of appropriate means.
.2 Post notices and signage at entry points and at other strategic locations identifying entrance onto site to be restricted to authorized persons only.
.3 Signage must be professionally made, bilingual in both official languages or display internationally understood graphic symbols.

.2 Approve and grant access to site only to workers and authorized persons.
.1 Immediately stop non-authorized persons from circulating in construction areas and remove from site.
.2 Provide site safety orientation to all persons before granting access. Advise of site conditions, hazards and mandatory safety rules to be observed on site.

.3 Secure site at night time to extent required to protect against unauthorized entry.

.4 Ensure persons granted access to site wear appropriate personal protective equipment (PPE) suitable to work and site conditions.
.1 Provide such PPE to authorized persons who require access to perform inspections or other approved purposes.

1.5 Protection

.1 Carry out work placing emphasis on health and safety of the Public, Facility personnel, construction workers and protection of the environment.

.2 Erect safety barricades, lights and signage on site to effectively delineate work areas, protect pedestrian and vehicular traffic around and adjacent to work and to create a safe working environment.

.3 Should 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 Departmental Representative verbally and in writing.

1.6 Filing Of Notice

.1 File Notice of Project and other Notices with Provincial authorities prior to commencement of Work.

1.7 Permits

.1 Post on site permits, licenses, compliance certificates specified in section 01 10 10.

.2 Where particular permit or compliance certificate cannot be obtained at the required stage of work, notify Departmental Representative in writing and obtain his/her approval to proceed before carrying out that portion of work.

1.8 Hazard Assessments

.1 Conduct site specific health and safety hazard assessment before commencing project and during course of the work. Identify risks and hazards resulting from site conditions, weather conditions and work operations.

.1 Also, conduct assessment when the scope of work has been changed by Change Order and when potential hazard or weakness in current health and safety practices are identified by Departmental Representative or by an authorized safety Representative.

.2 Record results in writing and address in Health and Safety Plan.

.3 Keep copy of all assessments on site.

1.9 Project/Site Condition

.1 The following are known or potential project related health, environmental and safety hazards at site which must be properly managed if encountered during course of work:

.1 Existing hazardous products are:

.1 work within and adjacent to roadway .

.2 work adjacent to streams and water

.2 Above list shall not be construed as being complete and inclusive of potential health, and safety hazards encountered during work. Include above items into hazard assessment process.

.3 Obtain from Departmental Representative, copy of MSDS Data sheets for existing hazardous products stored on site or used by Facility personnel.

1.10 Health And Safety Meetings

.1 Attend pre-construction health and safety meeting conducted by Departmental Representative. Have following persons in attendance:

.1 Site Superintendent.

.2 Contractor's designated Health and Safety Site Supervisor.

.3 Health & Safety Site Coordinator.

.4 Departmental Representative will advise of date, time and location.

1.11 Health And Safety Plan

.1 Develop written site-specific Project Health and Safety Plan, based on hazard assessments, prior to commencement of work.

.1 Submit copy to Departmental Representative within 5 calendar

days of acceptance of bid.

.2 Submit updates as work progresses.

.2 Health and Safety Plan shall contain three (3) parts with following information:

.1 Part 1 - Hazards: List of individual health risks and safety hazards identified by hazard assessment process.

.2 Part 2 - Safety Measures: engineering controls, personal protective equipment and safe work practices used to mitigate hazards and risks listed in Part 1 of Plan.

.3 Part 3a: Emergency Response: standard operating procedures, evacuation measures and emergency response in the occurrence of an accident, incident or emergency.

.1 Include response to all hazards listed in Part 1 of Plan.

.2 Evacuation measures to complement the Facility's existing Emergency Response and Evacuation Plan. Obtain pertinent information from Departmental Representative.

.3 List names and telephone numbers of officials to contact including:

.1 General Contractor and all Subcontractors.

.2 Federal and Provincial Departments as stipulated by laws and regulations and local emergency resource organizations, as needed based on nature of emergency or accident.

.3 Officials from PWGSC and site Facility management. Departmental Representative will provide list.

.3 Part 3b - Site Communications:

.1 Procedures used on site to share work related safety issues between workers, subcontractors, and General Contractor.

.2 List of critical tasks and work activities, to be communicated with the Facility Manager, which has risk of affecting tenant operations, or endangering health and safety of Facility personnel and the general public. Develop list in consultation with the Departmental Representative.

.4 Prepare Health and Safety Plan in a three column format, addressing the three parts specified above, as follows:

Column 1	Column 2	Column 3
Part 1	Part 2	Part 3a/3b
Identified Hazards	Safety Measures	Emergency Response & Site Communications

.5 Develop Plan in collaboration with subcontractors. Address work activities of all trades. Revise and update Plan as Sub-contractors arrive on site.

.6 Implement and enforce compliance with requirements of Plan for full duration of work to final completion and demobilization from site.

.7 As work progresses, review and update Plan. Address additional health risks and safety hazards identified by on-going hazard assessments.

.8 Post copy of Plan, and updates, on site.

.9 Submission of the Health and Safety Plan, and updates, to the Departmental Representative is for review and information purposes only. Departmental Representative's receipt, review and any comments made of the Plan shall not be construed to imply approval in part or in whole of such Plan by Departmental Representative and shall not be interpreted as a warranty of being complete and accurate or as a confirmation that all health and safety requirements of the Work have been addressed and that it is legislative compliant. Furthermore, Departmental Representative's review of the Plan shall not relieve the Contractor of any of his legal obligations for Occupational Health and Safety provisions specified as part of the Work and those required by provincial legislation.

1.12 Safety Supervision and Inspections

.1 Designate one person to be present on site at all times, responsible for supervising health and safety of the Work.
.1 Person to be competent in Occupational Health and Construction Safety as defined in the Provincial Occupational Health and Safety Act.

.2 Assign responsibility, obligation and authority to such designated person to stop work as deemed necessary for reasons of health and safety.

.3 Conduct regularly scheduled informal safety inspections of work site on a minimum bi-weekly basis.
.1 Note deficiencies and remedial action taken in a log book or diary.

.4 Keep inspection reports on site.

1.13 Training

.1 Ensure that all workers and other persons granted access to site are competently trained and knowledgeable on:
.1 Safe use of tools and equipment.
.2 How to wear and use personal protective equipment (PPE).
.3 Safe work practices and procedures to be followed in carrying out work.
.4 Site conditions and minimum safety rules to be observed on site, as given at site orientation session.

1.14 Minimum Site Safety Rules

.1 Notwithstanding the requirement to abide by federal and provincial health and safety regulations, the following safety rules shall be considered minimum requirements to be obeyed by all persons granted site access:
.1 Wear personnel protective equipment (PPE) appropriate to function and task on site; the minimum requirements being hard hat, safety footware and eye protection.
.2 Immediately report unsafe activity or condition at site, near-miss accident, injury and damage.
.3 Maintain site in tidy condition.
.4 Obey warning signs and safety tags.

.2 Brief workers on site safety rules and on disciplinary measures to be taken by Departmental Representative for violation or non compliance of such rules. Post rules on site.

.3 The following actions or conduct by Contractor, workers and subcontractors will be considered as non conformance with the health and safety requirements of the contract for which a Non-Compliance Notification will be issued to the General Contractor by the Departmental Representative:
.1 Failure to follow the minimum site safety rules specified above.
.2 Negligence resulting in serious injury or major property damage.
.3 Deliberate non-compliance with Federal and Provincial Acts and Regulations.

.4 Falsification of information in Workers Compensation Reports, safety reports and other health and safety related documents submitted to Departmental Representative or to Authority having jurisdiction.
.5 Possession of firearms on site.
.6 Possession of non-prescriptive illegal drugs or alcohol.
.7 Action, or lack thereof, resulting in the issuance of Warnings, Fines or Stop Work Orders from a Provincial Authority having jurisdiction.
.8 Violation of other specified health and safety rules and requirements as determined by Departmental Representative.

.4 See elsewhere in this section for details on Non-Compliance Notifications and resulting disciplinary measures.

1.15 Accident Reporting

.1 Investigate and report the following incidents and accidents:
.1 Those as required by Provincial Occupational Health and Safety Act and Regulations.
.2 Injury requiring medical aid as defined in the Canadian Dictionary of Safety Terms-1987, published by the Canadian Society of Safety Engineers (C.S.S.E)as follows:
.1 Medical Aid Injury: any minor injury for which medical treatment was provided and the cost of which is covered by Workers' Compensation Board of the province in which the injury was incurred.
.2 Property damage in excess of $5000.00,
.3 Interruption to Facility operations with potential loss to a Federal Dept. in excess of $5000.00,
.4 Those which require notification to Workers Compensation Board or other regulatory agencies as stipulated by applicable law or regulations.

.2 Send written report to Departmental Representative for all above cases.

1.16 Tools and Equipment Safety

.1 Routinely check and maintain tools, equipment and machinery for safe operation.

.2 Conduct checks as part of site safety inspections. When requested, submit proof that checks and maintenance have been carried out.

.3 Tag and immediately remove from site items found faulty or defective.

1.17 Hazardous Products

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS).

.2 Keep MSDS data sheets for all products delivered to site. Post on site. Submit copy to Departmental Representative upon receipt.

1.18 Confined Spaces

.1 Carry out work in confined spaces in compliance with:
.1 Provincial Occupational Health and Safety Regulations and;
.2 Canada Occupational Safety and Health Regulations (COSH) made under the Canada Labour Code - Part II.

.2 Conduct hazard assessment and address in Safety Plan before entering confined space.

1.19 Posting of Documents

.1 Post on site safety documentation as stipulated by Authorities having jurisdiction and as specified herein. Place in a common visible location.

1.20 Site Records

.1 Maintain on site a copy of all health and safety documentation and reports specified to be produced as part of the work and received from authorities having jurisdiction.

.2 Upon request, make available to Departmental Representative and to other authorized safety representative for review. Provide copy when directed by Departmental Representative.

1.21 Non Compliance and Disciplinary Measures

.1 Immediately address and correct health and safety violations and non-compliance issues.

.2 Negligence or failure to follow occupational health and safety provisions specified in the Contract Documents and of those of applicable federal and provincial laws and regulations could result in disciplinary measures taken by the Departmental Representative against the General Contractor.

.3 PWGSC uses a system of Non-Compliance Notifications and Disciplinary Measures on projects as follows:
.1 A non-compliance notification will be issued to the General Contractor, by the Departmental Representative, whenever there is a violation or failure to follow any of the project's occupational health and safety requirements by a worker, subcontractor or any other person to whom the Contractor has granted access to the work site.
.2 Non-Compliance notifications are progressive in nature resulting in increased disciplinary measures imposed depending on the frequency, nature and severity of the infraction.
.3 Disciplinary measures could include:
.1 Removal of the offending person or party from site;

.2 Financial penalties in the form of progress payment reduction or holdback assessments made against the Contract and;

.3 Taking the Work Out of Contractor's Hands in accordance with the General Conditions.

.4 Departmental Representative will make final decision as to what constitutes a violation and when to issue a Non-Compliance Notification.

.5 Non-compliance Notifications issued by Departmental Representative shall not be construed as to overrule or disregard warnings, orders and fines levied against Contractor by a regulatory agency having jurisdiction.

.6 Details of the Non-Compliance Notification and Disciplinary Measures system will be provided by Departmental Representative upon acceptance of bid and prior to commencement of work.

.7 Further details on the disciplinary system will be provided at the pre-construction Health and Safety meeting.

.8 Be responsible to fully brief workers and subcontractors on the operation and importance of this system.

PART 2 - PRODUCTS

2.1 NOT USED .1 Not Used.

PART 3 - EXECUTION

3.1 NOT USED .1 Not Used.

1 General

1.1 SECTION INCLUDES

.2 Waste management plan.
.3 Third party responsibilities.
.4 Storage, Handling and Protection
.5 Waste management plan implementation.
.6 Disposal of waste.

1.2 WASTE MANAGEMENT PLAN

.1 Draft Waste Management Plan: Within twenty (20) days after receipt of Notice of Award of Bid, or prior to any waste removal, whichever occurs sooner.
.2 Contractor to submit a Draft Waste Management Plan to the Department Representative for review, refer to sample attached to the end of this Section.
.3 Draft Plan shall contain the following:

- .1 Analysis of the proposed site waste generated, including types and quantities.
- .2 Landfill Options: The name of the landfill where trash will be disposed, the applicable landfill fees, and the projected cost of disposing of Project waste in the landfill.
- .3 Alternatives to Landfill: A list of each material proposed to be salvaged, reused, or recycled during the course of the Project, the proposed local market for each material, and the estimated net cost savings or additional costs resulting from separating and recycling versus landfill each material; "Net" means that the following have been subtracted from the cost of separating and recycling:
  - .1 Revenue from the sale of recycled or salvaged materials, and
  - .2 Landfill tipping fees saved due to diversion of materials

  from the landfill. The list of these materials is to include, at minimum, the following materials:
    - .1 Cardboard.
    - .2 Clean dimensional wood.
    - .3 Beverage containers.
    - .4 Plastic buckets; waste can be reduced by using plastic lined cardboard dry packed materials instead of premixed moist packed materials where this option is available.
    - .5 Paint.
    - .7 Packaging, where recycling programs are available.
    - .8 Rigid plastic foam insulation, where recycling programs are available.

.4 Resources for Development of Waste Management Plan: The following sources may be useful in developing the Draft Waste Management Plan:

- .1 Recycling Haulers and Markets: Investigate local haulers and markets for recyclable materials, and incorporate into Waste Management Plan.
- .2 Recycling Economics Information: Information available to bidders with regards to estimating the value of recyclable costs is included in Waste Reduction Information for Bidders.

.5 Final Waste Management Plan: Once the Owner has determined which of the recycling options addressed in the draft Waste Management Plan are acceptable, the Contractor shall submit, within ten (10) calendar days a Final Waste Management Plan, containing the following:

.1 Analysis of the proposed jobsite waste to be generated, including types and quantities.
.2 Landfill options: The name of the landfill where trash will be disposed of, the applicable landfill tipping fees, and the projected cost of disposing of all Project waste in the landfill.
.3 Alternatives to Landfill: A list of the waste materials from the Project that will be separated for reuse, salvage, or recycling.
.4 Meetings: A description of the regular meetings to be held to address waste management, refer to Section 013100.
.5 Materials Handling Procedures: A description of the means by which any waste materials identified in 1.5.3 above will be protected from contamination, and a description of the means to be employed in recycling the above materials consistent with requirements for acceptance by designated facilities.
.6 Transportation: A description of the means of transportation of the recyclable materials, whether materials will be site-separated and self-hauled to designated centres, or whether mixed materials will be collected by a waste hauler and removed from the site, and destination of materials.
.7 Where requirements are more stringent than the specified waste management plan the contractor shall conform to the following policy:
In addition all waste will be qualified by type of material and its weight. At a minimum the following products must be recycled: beverage containers, clean dimensional wood, corrugated cardboard, glass, metals and plastic.
After acceptance of their project proposal and before starting work, contractors must submit to the Departmental Representative a partially completed Waste Management Form. The form must include a list of expected waste materials and the recycling facilities to which contractors will take the waste. Contractors must also identify any waste materials that cannot be recycled or reused and must be disposed of in a landfill. If the contractors believe that they will not be able to recycle at a minimum to 50% of the project waste, they must receive written exception prior to beginning work.

1.3 THIRD PARTY RESPONSIBILITY

.1 Subcontractors shall cooperate fully with Contractor to implement the Waste Reduction Plan.
.2 Failure to cooperate may result in the Owner not achieving their environmental goal requirements and may result in penalties being assessed by the Contractor to the responsible Subcontractors.

1.4 STORAGE, HANDLING AND PROTECTION

.1 Store materials to be reused, recycled and salvaged in locations as directed by Consultant.
.2 Unless specified otherwise, materials for removal do not become Contractor's property.
.3 Protect, stockpile, store and catalogue salvaged items.
.4 Separate non-salvageable materials from salvaged items. Transport and

deliver non-salvageable items to licensed disposal facility.
.5 Protect structural components not removed for demolition from movement or damage.
.6 Support affected structures. If safety of building is endangered, cease operations and immediately notify Consultant.
.7 Protect surface drainage, storm sewers, sanitary sewers, and utility services from damage and blockage.

1.5 WASTE MANAGEMENT PLAN IMPLEMENTATION

.1 Manager: Contractor to designate an on-site party (or parties) responsible for instructing workers and overseeing and documenting results of the Waste Management Plan for the Project.
.2 Distribution: Contractor to distribute copies of the Waste Management Plan to the Job Site Foreman, each Subcontractor and the Departmental Representative.
.3 Instruction: Contractor shall provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the Project.
.4 Separation facilities: Contractor shall lay out and label a specific area to facilitate separation of materials for potential recycling, salvage, reuse, and return. Recycling and waste bin areas are to be kept neat and clean and clearly marked in order to avoid contamination of materials.
.5 Hazardous wastes: Hazardous wastes shall be separated, stored, and disposed of according to local regulations.
.6 Application for Progress Payments: Contractor shall submit with each Application for Progress Payment a Summary of Waste Generated by the Project:

.1 Failure to submit this information shall render the Application for
Payment incomplete and shall delay Progress Payment.
.2 The Summary shall be submitted on a form acceptable to the Owner and shall contain the following information:

.1 The amount in tonnes or cubic metres of material land filled from the Project,
.2 The identity of the landfill, the total amount of tipping fees paid at the landfill, and
.3 The total disposal cost. Include manifests, weight tickets, receipt, and invoices.

.3 For each material recycled, reused, or salvaged from the Project,
the amount tonnes or cubic metres, the date removed from the job site, the receiving party, the transportation cost, the amount of any money paid or received for the recycled or salvaged material, and the net total cost or savings of salvage or recycling each material.
.4 Attach manifests, weight tickets, receipts, and invoices.

1.6 DISPOSAL OF WASTE

.1 Burying of rubbish and waste materials is prohibited unless approved by authority having jurisdiction.
.2 Disposal of waste into waterways, storm, or sanitary sewers is prohibited.

End of Section