

Garrison Graveyard , Cast Iron Fence

**SPECIFICATIONS
for
GARRISON GRAVEYARD , CAST IRON FENCE
ANNAPOLIS ROYAL, NOVA SCOTIA**

**Prepared by:--
EKISTICS, PLANNING AND DESIGN
for
PARKS CANADA**

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GENERAL INSTRUCTIONS;

1. Description :-- In general , the work consists of furnishing all labour, equipment , materials as specified, transportation and supervision necessary for the repair of an historic fence as described as follows.

2. Contractor's Use of Site:-- During work under this project, free and unimpeded access by the public to the Site must be maintained where possible. The Contractor shall arrange operations so as not to inhibit the normal functioning of the National Historic Site and so as not to endanger the visiting public.

3. Relics and Antiquities:-- Give immediate notice to the superintendent if evidence of any artefacts is encountered during construction, and await her written instructions before proceeding with work in this area. All relics and antiquities and items of historical or scientific interest found on the Site shall remain the property of Parks Canada. Protect such articles and request direction from the Superintendent.

4. Site Limitations:--- Due to the sensitive nature of this Site, the use of heavy equipment is restricted in and around the grounds of the National Historic Site. All access routes and methods of equipment use must be approved by the Superintendent in advance of any repair work.

5. Weather:-- Ensure that no part of the work is jeopardized by the effects of adverse weather conditions.

6. Security:---The Contractor shall ensure that the Site is left safe and secure at all times outside periods of work under this Contract.

NOTE:- The Ft Anne fence is a highly valuable Historical asset and hence Parks Canada will only award this contact to a company with a minimum of 5 years of experience in working with historical metal elements preferably cast iron . The Company bid is to be accompanied by an explanation of and extent of this experience of the Company or of an individual in the Company who will be the direct and on-site manager of this work.

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1.1 Background

This fence is considered to be a rare surviving example of Nova Scotia Cast Iron from this period and a Level II Cultural Resource for the Park. The trees and fence have long been a part of the traditional streetscape.

In 1872 the fence was fabricated by the Halifax foundry of Munro & O'Neill and erected along St. George Street. The surviving fence is approximately 77.5m (254'), long and contains 19 panels (each 3.64m or approx. 12 ft. long) plus a gateway and turnstile. Each panel has 24 balusters 914 mm (36") high with open backs where they are threaded along a 9 mm (3/4") diameter rod at the top of the unit. They are pinned into a flat bar at the bottom. These elements are fastened into the post and there is a granite support located mid-span of the flat bar. The fence also contains a double gate with 8 balusters 1295 mm (51") high in each section. Beside the gate is a turn-stile about 914 mm (36") across. To replace one baluster one must remove and disassemble a section of fence as well as a post. The posts are constructed from at least 4-5 components – main post, a collar, a bell, and a bell nut connected to a 16 mm (5/8") diameter threaded rod up the middle of the post. Overall the fence has 459 @ 914 mm (36") and 12 1295 mm (51") balusters and 21 posts, two gateposts and one turnstile post.

The Park has about 50 reproduction balusters, in storage.

Each panel has bracing to stabilize each section. Some of this bracing has been removed and some has been poorly replaced, increasing the flexibility of each section and the rate of failure of the coatings. The most recent (Feb. 2016) inspection and assessment of the fence has identified the main problem to be corrosion of the top rod, which threads through the balusters and is fixed from post to post. The failure of this rod, which appears to be mild steel has damaged many of the balusters through rust expansion. Secondary causes of damage include breakage through impact. Also, the overall installation and current elevation of the fence appears to be 150mm or so deeper into the ground than when originally installed. Remedial work is required to ensure the long-term survival of this Level II Cultural Resource.

1.2 Detailed Assessment

There is no easy way to identify replacement elements from previous interventions. The sections of fence that have the bottom bar below grade, exhibited no signs of damage where they were exposed during the inspection. The fence is designed with a gap in back of the baluster collars where they thread onto the upper connecting rod, leaving a short section of it visible. Where the paint film has failed, rainwater enters these gaps and the rod corrodes causing cracks in the collars of the balusters as it expands. The cast iron elements do not appear to exhibit deterioration by any other mechanisms. Each panel is supported with a granite stone at the midpoint of the bottom bar. All of the braces supporting the fence are bent, and many are detached whilst others are sunk into neighbouring trees. On panels where the brace is detached the balustrade is very flexible. This flexibility leads to early failure of applied coatings.

Two approaches were evaluated for conservation of the fence panels: disassembly of panels or conservation without disassembling panels. SEE the following table:---

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Ft. Anne, Annapolis Royal NHS
Cemetery Fence.

NOTE :- Panel 1 is at the Courthouse side of the cemetery

Panel #	BALUSTRADES	HORIZONTAL ROD	CENTRE SUPPORT	GENERAL COMMENT
1	25 good cond.	Good cond.	OK	Panels 1,2 &3 were taken apart and re instated approx. 8 yrs ago by Park staff.
2	25 good cond.	Good cond.	OK	
3	25 good cond.	Good cond.	OK	
4	25 good cond.	Poor cond.	OK	Panel in good condition however horizontal rod needs to be scraped, sealed and painted (in situ.)
5	25 good cond.	Poor cond.	Into a tree needs to be removed and re set.	Same comment as above.
6	25 good cond.	Poor cond.	Loose. Needs reconnected.	Same comment as above.
7	3 broken and 1 cracked.	V.poor condition	Into a tree needs to be removed and reset.	Remove panel and dismember treat and re assemble using new rod. & replaced balustrades.
8	1 broken , 1 cracked and 1 partially cracked.	v. poor condition	Loose .	Remove panel and dismember, treat and re assemble using new rod. & replaced balustrades. Panel is bent.
9	1 broken, 3 cracked	v. poor condition	loose	Remove panel and dismember, treat and re assemble using new rod. & replaced balustrades.
10	25 good condition	Reasonable... .see comments	loose	Panel in good condition however horizontal rod needs to be scraped, sealed and painted (in situ.)
11	3 broken, 1 cracked.	v. poor condition	Need to replace,	Remove panel and dismember treat and re assemble using new rod. & replaced balustrades.
12	2 broken, 1 cracked	Poor condition	OK	Remove panel---- dismember, treat and re assemble using new rod and replace balustrades.

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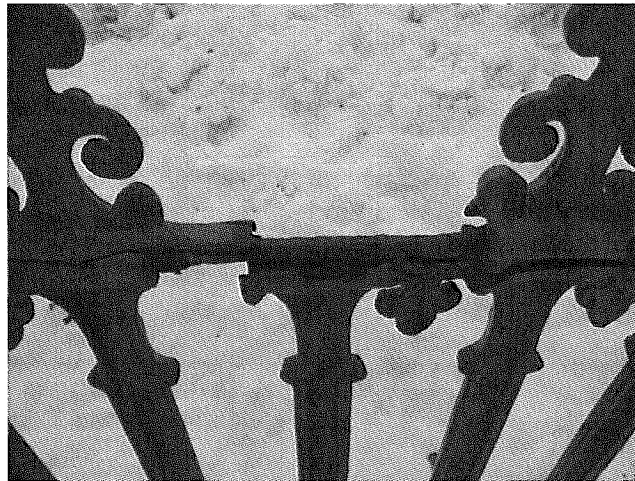
13	4 broken, 1 cracked	Poor condition	OK	Remove panel---- dismember, treat and re assemble using new rod and replace balustrades.
NOTE				Post between panels 13 and 14 has shifted.
14	25 good condition	Reasonable: see comments	OK Large tree stump behind.	Panel and rod could be scraped, treated and sealed etc. (in situ.)
NOTE				Post between Panels 14 and 15 completely broken.
15	25 good condition	Reasonable; see comments	Small tree stump. Remove centre support and relocate,	Panel and rod could be scraped, treated and sealed etc. (in situ.) Will have to reconnect S.side to new post.
NOTE				Post between Panels 15 and 16 has 2 small cracks. Care needed when re setting..
16	1 broken	Reasonable	NO centre support.	Panel v. close to large tree. Remove panel---- dismember, treat and re assemble using new rod and replace balustrade.
GATE	8 balustrades per side. All in good cond.	Both rods in good condition.	Remove support rod from S.gate post and tree. Reset in other location.	2 gate posts in excellent condition 2 gate panels could be treated in situ.
TUR NStyl e				In goog condition. Clean and treat wooden X bars.
17	7 broken	v. poor cond.	Goes into tree.	This panel is very close to a large tree. Panel is bent. Remove panel---- dismember, treat and re assemble using new rod and replace balustrades.
18	2 broken, 1 cracked.	v. poor cond.	loose	Remove panel---- dismember, treat and re assemble using new rod and replace balustrades.
19	6 broken, 3 cracked	v. poor condition.	loose	Remove panel---- dismember, treat and re assemble using new rod and replace balustrades.

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Note				Final post---(Town side) in good condition.
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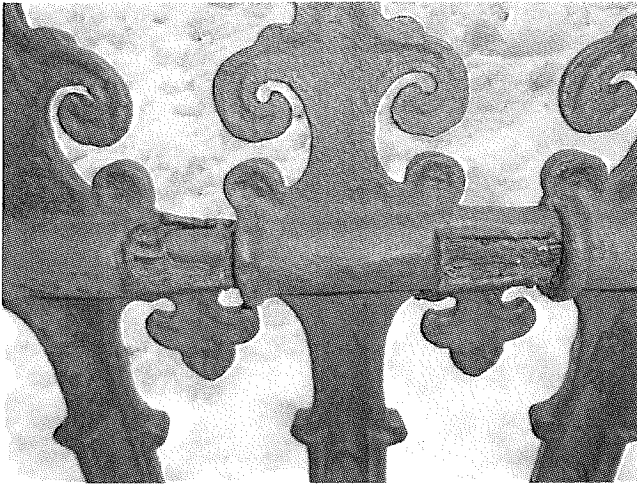


GENERAL CONDITIONS FOR EXISTING CONDITION SURVEY 8TH FEB. 2016.

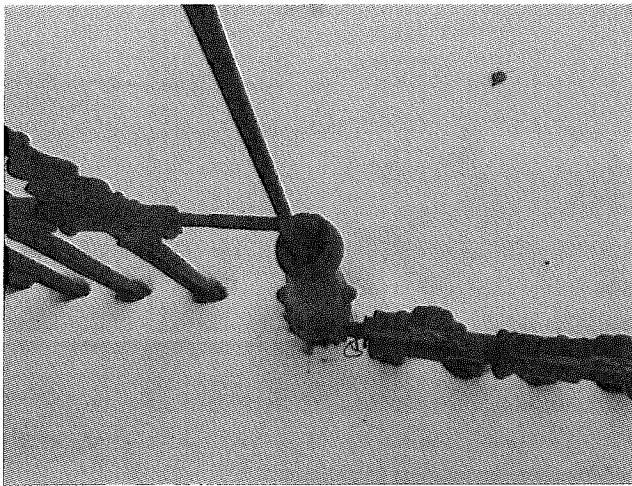


HORIZONTAL ROD & BROKEN BALUSTRADE ----- GENERAL CONDITION .

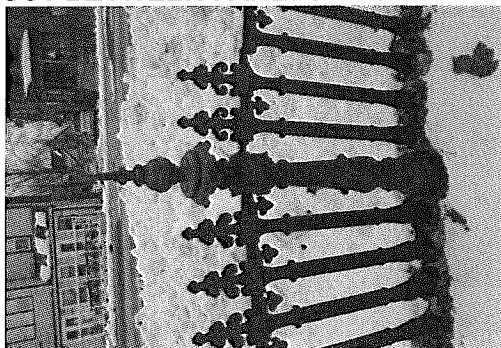
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PANELS IN GOOD CONDITION---WE SUGGEST TREATING THE HORIZONTAL ROD IN SITU.



BROKEN POST BETWEEN PANELS 14 & 15.

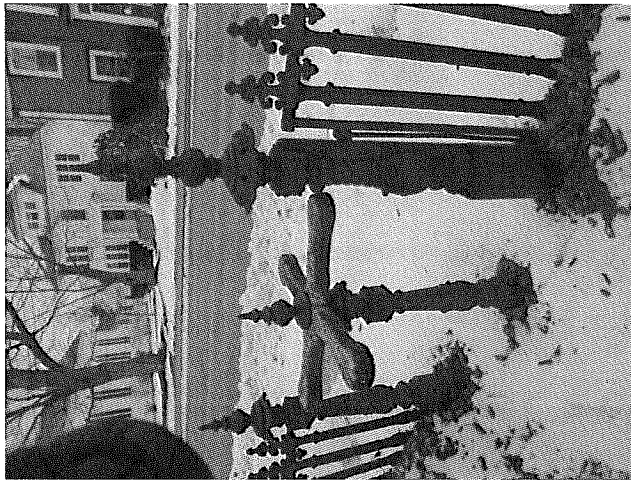


TYPICAL POST

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GATE



TURN STYLE AND GATE POST.



PANELS 17,18 AND FINAL 19.

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1.3 Detailed breakdown of work req'd:---

- .1 The total fence, gate and turnstile is to be relocated roadwards and elevated approx. 150 mm as per the attached drawing detail.
- .2 All 19 panels will be removed from their supporting posts and recorded in the sequence of their original position.
- .3 The following panels will be completely disassembled in the contractors indoor facility---- 19;18;17;16;13;12;11;9;8;7 ; Treatment and re assembly as per the following specs.
- .4 The following panels will be removed as a complete panel to the contractors indoor facility and treated as per the following specs. ---the 2 gate panels; the turnstile post; 1;2;3;4;5;6; 10;14;15;
- .5 The two broken vertical posts will be replaced as per the following spec.
- .6 As each panel is re assembled onto the fence granite blocks to match the existing that still remain are to be placed mid point under the lower horizontal bar.
- .7 Each panel will have a new steel brace at the 1/3 point of the panel (i.e. 2 new braces per panel) For brace see attached detailed drawing. **Do not add additional supports to the bottom bar; This will stiffen the fence to mitigate against early failure of coatings . Brace location will need to respect locations of trees and above and below grade cultural resources;**
- .8 Only minor touch-up painting will be allowed on site during the fence re assembly .
- .9 The fence will be straight and plumb upon completion of the work.
- .10 The job will be accepted upon complete inspection and approval of all work by the Parks Canada designated project manager

1.4 Disassembly

- .1 The disassembly approach relies on replacement of the top rod and getting good coverage on the coating . There is a risk that balusters will be broken during disassembly, and that the method of loosening the corrosion will cause problems with re establishing the paint coating.
- .2 For those panels to be treated thus we will allow for 20% breakage of balusters.
- .3 As per conservation practise all balusters will be labeled to the panel they were removed from. NOTE:--- During re assembly existing balusters will be put together on panels and those panels recorded. (i.e. put original balusters together and the same for new components)
- .4 Gentle Heat: Apply heat using a torch or heat gun. Differential expansion of the metal will help release seized parts. This will likely remove some of the paint and corrosion. The heat will cause metallurgical changes and great care is necessary to make sure the cast iron is heated evenly.
- .5 Subject the panel to an abrasive "sand" blasting using crushed walnut shell as the abrasive. Considerable care is necessary to minimise damage to either individual fence components or complete panels.

1.5

Balusters and posts

- .1 This contract will use the approx. 50 reproduced balusters in Parks Canada's possession AND the provision of another 50 as back up for those broken during disassembly.
The units will match the existing and be cast iron .The supplier to be approved by Parks Project manager. (Recommend-----Black River Castings ,N.B. Or equivalent)
- .2 All new balusters are to be put together on panels and those panels recorded.
- .3 Two new posts will match the existing and be cast iron (see .1 above)

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1.6

Horizontal bars.

- .1 For the disassembled panels the replacement upper rod will be a 19mm diam. Pultruded Fiberglass Rod as supplied by Liberty Pultrusions or an approved equal. These rods do not come threaded therefore they will be secured within their support posts by a galvanised U-bolt.
- .2 The lower bar will be replaced like with like in galvanised steel.

1.7

Filler

- .1 Gaps that allow rain to enter on complete panels (i.e. those not disassembled) will be sealed up using Black Urethane Weld by 3M or an approved equivalent with a compatible Single Step primer by 3M. This will be a reversible process. These fillers should be applied before the paint coating is installed on the panels.

1.8

Painting

- .1 All disassembly, de scaling and rust removal leading to painting either of component parts or complete panels will be done in the contractors enclosed facility.
- .2 The Project manager is to review and approve metal components prior to the commencement of the painting process.
- .3 The following painting system is proposed—however an equivalent of superior product can be suggested by the contractor and used if approved by the Project Manager.
- .4 The finished coats are to be Sherwin Williams Acrolon Acrylic Polyurthane , black, semi gloss (or matt if available); undercoat/ primer to be an organic, zinc rich compatible and supplied by Sherwin Williams. Refer to the product application bulletin for detailed surface preparation information.
- .5 Prime and paint the entire fence in the shop prior to returning it to the site for installation. Following assembly of the fence, touch up all areas newly joined in the assembly as well as the areas of the paint coatings that are damaged during installation, to ensure the continuity of the coating.

1.9

- Reset** ----- each fence post so as to ensure that it functions properly while facilitating future maintenance/conservation actions on the post. Excavation needs to be done in accordance with the provisions of Parks Canada 's : *Conservation of Below Ground Resources*. In each post hole a concrete base will be established in an excavation with a cylindrical tube placed around it so that future maintenance can occur without disturbing the surrounding soil; set the post in gravel in the tube to maintain drainage and set the elevation of the post so that the fence is installed maintaining its original relationship to the new grade as per the detail . Re-install the granite support at the mid span of the flat bar to keep the bar level between the posts.

1.0 HEALTH AND SAFETY

- .1 With respect to the Garrison Graveyard, Cast Iron Fence Project, Fort Anne National Historic Park, Work Site Safety is the responsibility of the Contractor, who under this Contract is "Principal Contractor":
 - .1 The Contractor shall, for the purposes of the Occupational Health and Safety Act (Nova Scotia), and for the duration of the Work of this Contract:
 - .1 Be the "Principal Contractor" for the "Work Site", and
 - .2 Meet all requirements of the Occupational Health and Safety Act and Regulations, Workers Compensation Board legislation, the Fire Code legislation and all other applicable laws that govern workplace safety.
 - .2 The Contractor shall direct all Subcontractors, sub-subcontractors, Other Contractors, employees, suppliers, workers and any other persons at the "Work Site" on safety related matters, to the extent required to fulfill its "Principal Contractor" responsibilities pursuant to the Act, regardless of:
 - .1 Whether or not any contractual relationship exists between the Contractor and any of these entities, and
 - .2 Whether or not such entities have been specifically identified in this Contract.
 - .3 Safety Certification: Safety certification is a condition of contract award; Contractor is required to maintain a valid Certificate of Recognition (COR) for the duration of the Work of this Contract.
- .2 References:
 - .1 Health Canada/Workplace Hazardous Materials Information System (WHMIS):
 - .1 Material Safety Data Sheets (MSDS).
 - .2 Province of Nova Scotia:
 - .1 Occupational Health and Safety Act, Workplace Hazardous Materials Information System Regulations, Occupational Safety General Regulations.
- .3 Submittals:
 - .1 Submit site-specific Health and Safety Plan: Within 7 days after date of Notice to Proceed and prior to commencement of Work. Health and Safety Plan must include:
 - .1 Results of site-specific safety hazard assessment.
 - .2 Results of safety and health risk or hazard analysis for site tasks and operation found in work plan.
 - .2 Submit 2 copies of Contractor's authorized representative's work site health and safety inspection reports to Departmental Representative and authority having jurisdiction, weekly.
 - .3 Submit copies of reports or directions issued by Federal and Provincial health and safety inspectors.
 - .4 Submit copies of incident and accident reports.
 - .5 Submit WHMIS MSDS - Material Safety Data Sheets.

- .4 Filing of Notice:
 - .1 File Notification of Construction Project with Provincial authorities prior to beginning of Work.
- .5 Safety Assessment:
 - .1 Perform site-specific safety hazard assessment related to project.
- .6 Meetings:
 - .1 Schedule and administer Health and Safety meeting with Departmental Representative prior to commencement of Work.
- .7 Regulatory Requirements:
 - .1 Do Work in accordance with REGULATORY REQUIREMENTS.
- .8 General Requirements:
 - .1 Develop written site-specific Health and Safety Plan based on hazard assessment prior to beginning site Work and continue to implement, maintain, and enforce plan until final demobilization from site. Health and Safety Plan must address project specifications.
 - .2 Departmental Representative may respond in writing, where deficiencies or concerns are noted and may request re-submission with correction of deficiencies or concerns.
- .9 Responsibility:
 - .1 Be responsible for health and safety of persons on site, safety of property on site and for protection of persons adjacent to site and environment to extent that they may be affected by conduct of Work.
 - .2 Comply with and enforce compliance by employees with safety requirements of Contract Documents, applicable federal, provincial, and local statutes, regulations, and ordinances, and with site-specific Health and Safety Plan.
- .10 Compliance Requirements:
 - .1 Comply with Occupational Health and Safety Act, Occupational Safety General Regulations, Nova Scotia.
- .11 Unforeseen Hazards:
 - .1 When unforeseen or peculiar safety-related factor, hazard, or condition occur during performance of Work, follow procedures in place for Employee's Right to Refuse Work in accordance with Acts and Regulations of Province having jurisdiction and advise Departmental Representative verbally and in writing.
- .12 Health and Safety Coordinator:
 - .1 Employ and assign to Work, competent and authorized representative as Health and Safety Coordinator. Health and Safety Coordinator must:
 - .1 Have site-related working experience specific to activities.
 - .2 Have working knowledge of occupational safety and health regulations.
 - .3 Be responsible for completing Contractor's Health and Safety Training Sessions and ensuring that personnel not successfully completing required training are not permitted to enter site to perform Work.
 - .4 Be responsible for implementing, enforcing daily, and monitoring site-specific Contractor's Health and Safety Plan.

- .5 Be on site during execution of Work and report directly to and be under direction of site supervisor.
- .13 Posting of Documents:
 - .1 Ensure applicable items, articles, notices and orders are posted in conspicuous location on site in accordance with Acts and Regulations of Province having jurisdiction, and in consultation with Departmental Representative.
- .14 Correction of Non-Compliance:
 - .1 Immediately address health and safety non-compliance issues identified by authority having jurisdiction or by Departmental Representative.
 - .2 Provide Departmental Representative with written report of action taken to correct non-compliance of health and safety issues identified.
 - .3 Departmental Representative may stop Work if non-compliance of health and safety regulations is not corrected.
- .15 Powder Actuated Devices:
 - .1 Use powder actuated devices only after receipt of written permission from Departmental Representative.
- .16 Work Stoppage:
 - .1 Give precedence to safety and health of public and site personnel and protection of environment over cost and schedule considerations for Work.

1.1 REGULATORY REQUIREMENTS

- .1 Parks Canada:
 - .1 Perform Work in compliance with the recommendations of “*Standards and Guidelines for the Conservation of Historic Places in Canada*,” second edition, © Her Majesty the Queen in Right of Canada, 2010.
- .2 References and Codes:
 - .1 Perform Work in accordance with the National Building Code of Canada, 2010, and the Nova Scotia Building Code Regulations (2014) including amendments up to bid closing date, and other codes of federal, provincial or local application provided that in case of conflict or discrepancy, more stringent requirements apply. Conflicts or discrepancies shall be resolved at the sole and final discretion of the Departmental Representative.
 - .2 Meet or exceed requirements of the Contract Documents.
- .3 Municipalities:
 - .1 Perform Work in accordance with the by-laws and ordinances of the Municipality in the jurisdiction of the Work and to the direction of the *authorities having jurisdiction*.

END OF SECTION

