LIST OF SPECIFICATIONS

Section 01 33 23	Shop Drawing Procedures
Section 01 14 13	Site Protection and Access
Section 02 22 05	Selected Site Demolition
Section 31 22 13	Earthworks
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Section 32 12 16	Hot Mix Asphalt
Section 31 15 41	Rock Works
Section 03 11 00	Concrete Formwork
Section 03 20 00	Concrete Reinforcement
Section 03 30 00	Cast-In-Place Concrete
Section 32 92 23	Topsoil and Sod

PART 1.0 – GENERAL

1.1 SHOP DRAWINGS

.1 The Contractor shall submit fully detailed and dimensioned shop drawings wherever requested in these Specifications. Shop drawings shall show clearly, construction, layout, anchorage, designation of materials, finishes and all other relevant information. The Contractor is responsible for creating the schedule of submission dates.

.2 The shop drawing submittal and resubmittal shall be completely identified by showing the following.

a. Project name
b. Original date of issue
c. Signature and seal of licensed professional designer and/or applicable government standards – such as Canadian Standards Association (CSA), Canadian General Standards Board (CGSB), Illuminating Engineering Society (IES), etc.
d. Project number/job number/MPT number
e. Name and address of supplier and/or manufacturer
f. Name of the Contractor/sub-contractor/supplier/manufacturer
g. Drawing number and specification section to which the submittal applies
h. Relation to adjacent structure or materials
i. Identification of all products and materials.

Shop drawings that do not comply with these requirements shall be stamped **"REVISE AND RESUBMIT".**

.3 The Contractor shall stamp, sign, and date the shop drawings indicating that they have checked and reviewed the shop drawings for realistic field conditions, materials, catalogue number and to confirm that contract requirements are being met prior to submission to the Project Manager.

.4 Revise and resubmit drawings as required to obtain the Project Manager's **"Reviewed stamp".** The review of the shop drawing by the Project Manager is for the sole purpose of determining compliance with the general design concept. The review process shall not relieve the Contractor of their responsibility for errors and/or omissions in the shop drawings. The review and any subsequent resubmittals **will not be** a cause for any extension to the Contract's completion date.

.5 Shop drawings shall be submitted in the form of one (1) electronic set (PDF).

.6 Shop drawings shall be drawn to a minimum scale of 1:20 metric and shall show all details, dimensions and descriptions of materials and fastening.

.7 New information cannot be added to shop drawings previously submitted. New

information shall be submitted on new shop drawings.

.8 Each of the returned shop drawings will be stamped as follows:

REVIEWED	☐
REVIEWED AS NOTED	☐
REVISE AND RESUBMIT	☐
NOT REVIEWED	☐

If the "**REVIEWED**" is checked-off, the shop drawing is satisfactory. Shop drawings do not have to be re-submitted.

If the "**REVIEWED AS NOTED**" is checked-off, the shop drawing is satisfactory subject to requirements of remarks put on the shop drawings. Shop drawings do not have to be re-submitted.

If the "**REVISED AND RESUBMIT**" is checked-off, the drawing is entirely unsatisfactory and must be revised in accordance with comments written on the shop drawings. Shop drawings are to be revised and re-submitted for review. No Work is to proceed until the **"REVIEWED"** stamp is checked off.

If noted "**NOT REVIEWED**", the shop drawing is in error of submission, or is not applicable for the project, or information previously requested or marked up has not be complied with, or drawings not revised.

.9 Shop drawings are <u>not</u> Contract Documents. The purpose of their submittal is to review the conformity to the general design concept expressed in the contract documents. Review of shop drawings does not relieve the Contractor of the responsibility to comply with every aspect of the original contract documents. Any deviation from the original Contract Documents must be documented.

.10 The City representative will not accept photocopies of contract drawings as shop drawings, lists, schedules or sketches.

.11 The Contractor shall not proceed with Work prior to completion of shop drawing review process.

1.2 PRODUCT DATA

.1 Submit product data and manufacturer's instructions when requested in the specifications, or by the Project Manager, for the assembly and installation of specific materials or equipment. Obtain the review of the data by the Project Manager before commencing such Work.

1.3 SAMPLES

.1 The Contractor shall submit samples of whole or part of the material or equipment to be installed, whenever requested by the City representative and when requested in this Specification.

.2 Samples shall be of the same quality, finish, texture and colour identical to the ones to be installed, unless otherwise requested in this Specification.

.3 Submit RAL Paint # for Park Sign, or any fabrication that requires colour finishing.

.4 All colours, materials and designs must be reviewed by the Project Manager.

.5 Submit a minimum of two (2) of each item and identify each sample with the Project and Job Number, type of material, name of Contractor, Subcontractors, and manufacturers and suppliers.

END OF SECTION

PART 1.0 - GENERAL

1.1 SCOPE OF WORK

.1 This Section covers Work for protection of the site and immediate surrounding properties, and maintenance of public safety.

1.2 SITE AND TREE PROTECTION

.1 Ensure safety and security of the site, at all times. The Contractor is responsible for maintaining the construction fences and construction barriers and securing the site at the end of the working day. Provide two (2) sets of keys for use by the City, for any locks used on the site.

.2 Provide temporary locks for all mechanical or electrical cabinets and maintain for the duration of the Contract. The City will replace locks upon assuming the site. Provide two (2) sets of keys to the City for supplied temporary locks.

.3 Supply and install appropriate signage, clearly indicating that this is a construction site and that public access must be denied.

.4 Ensure that all excavations are covered or filled in at the end of the working day.

.5 Carry out all Works in a manner that affords the public and all site personnel the greatest safety, and in accordance with the Occupational Health and Safety Act.

.6 Use all care and diligence to protect Work and materials from any damage due to nature, accident, or design. Should any damage occur in spite of such precautions, the Contractor shall repair it at their own cost and leave the Work to the satisfaction of the Project Manager.

.7 The Contractor shall be responsible for the maintenance and reinstatement of disturbed survey bars and stakes, including all costs associated with the reinstatement of disturbed survey stakes for layout purposes.

.8 Supply and maintain construction fencing, silt control fencing and tree hoarding as indicated on Contract drawings. Provide periodical inspection on such fences especially after heavy rainfall/strong winds, to ensure they are still vertical and functional. If disturbed, reinstate at Contractor’s expense.

.9 Prior to any construction, tree protection fencing placement must be reviewed and approved by the Project Manager.

.10 The Contractor shall protect all trees and plants on site and adjacent areas, except where they are identified for removal in this Contract.

.11 The Contractor shall fell trees away from other vegetation that is to be retained. No trees shall be felled into or across watercourses unless approved by the Project Manager, and trees shall be felled to avoid damaging standing trees that are to remain.

.12 The Contractor shall protect the root zones of trees that are to remain, by preventing disturbance within the dripline. Vehicle traffic, dumping and storage of materials over the root zones of trees to remain is prohibited. Use vertical trench walls and appropriate support systems when excavating within the dripline of trees to remain. All exposed roots over 25mm in diameter shall be cut back cleanly to the soil surface within 48 hours of being exposed.

.13 Where unavoidable root damage or loss is extensive, portions of the tress shall be pruned by a qualified and experienced landscaper using approved arboriculture techniques and practices and shall retain as much of the plant's natural form as possible.

.14 When there are tree branches located within the job site, where they will interfere with construction operations, they shall be pruned prior to equipment entering the dripline of the tree. Branches shall be cut back to the nearest suitable trunk, crotch or lateral, where they will no longer interfere with construction operations.

1.3 SITE ACCESS AND MUD TRACKING

.1 The Contractor is responsible for reinstatement of the road surface material should any damage or contamination of the road materials occur during site construction Works.

.2 Adjustments to temporary fencing location to accommodate access may be made on site, at the discretion of the Project Manager.

.3 All suppliers of materials and equipment, all workers, and sub-trades shall be informed of above requirements, and appropriate signs shall be posted in clearly visible locations.

.4 Be fully familiar with all site conditions and regulations and requirements by authorities having jurisdiction, pertaining to access, use of public ways and utility corridors in the vicinity.

.5 Provide traffic control measures to the satisfaction of the Project Manager for all vehicular traffic entering and exiting the site onto public roadways.

.6 Mud and debris tracked on to any regional or local road, on/off ramps, or parking areas, shall be immediately cleaned up at no expense to the City and to the satisfaction of the Project Manager. Sweeping and/or washing down the surfaces may be required daily, as directed by the Project Manager. If the City is required

to effect clean-up, the Contractor will be back charged all costs associated with the effort.

1.4 EQUIPMENT CONTROL

.1 Control all equipment and vehicles on the site so that minimal disturbance is caused to existing or constructed features.

.2 Park vehicles and store equipment and tools only in approved locations of the site or adjacent lands, where approved by the Project Manager. Secure all vehicles, equipment and storage facilities from tampering.

.3 All site operations are to take place within the limit of the Contract area.

PART 2.0 - PRODUCTS

2.1 CONSTRUCTION FENCING

.1 Construction fencing, access gate and tree hoarding shall be supplied and installed as indicated on Contract Drawings.

.2 Precise location of construction fencing to be approved on-site by the Project Manager.

PART 3.0 - EXECUTION

3.1 CONSTRUCTION FENCING

.1 Construction fencing, silt control fencing, access gates and tree hoarding shall be placed and installed as indicated on drawings and details. On-site adjustments to the fencing locations may be made on-site at the discretion of the Project Manager.

.2 Preserve the integrity of the fencing, maintain taught and vertical, and restore as required for the duration of the Contract. Provide periodical inspections to ensure the fences are vertical and functional and reinstate, if disturbed, at Contractor's expense.

.3 Remove all fencing at the completion of the Contract and remove from the site.

.4 No fencing component, including braces and foot supports, shall encumber the public sidewalk at any time. If the sidewalk requires temporary closure for Work to be completed, adequate safety measures shall be installed as per the *Ontario Traffic Manual, Book 7 Temporary Conditions*, latest edition.

3.2 COOPERATION WITH OTHER CONTRACTORS

.1 Where two or more contractors, or City or other agency personnel, are involved in non-related or related Work on adjacent lands, each shall conduct his operation in such a manner as not to cause any unnecessary delay or hindrance to the other.

.2 Each contractor shall be responsible to the other for all damage to Work, to person, or to property, or for loss caused by failure to finish Work within the specified time for completion, or as specified by Specifications.

.3 Each contractor shall coordinate with other contractor(s), City or other agency personnel so as to facilitate access and movement without hindrance to each other's work, or to the functionality of existing facilities and operations on adjacent lands.

3.3 SITE CLEANLINESS

.1 Keep area outside construction zone clean and usable by others at all times.

.2 Maintain stockpiles of material in a location, and manner satisfactory to, and as directed by the Project Manager.

.3 Remove all debris and surplus material from the site at the completion of the work day.

3.4 RESTORATION

.1 All existing site components, appurtenances, structures and vegetation that are to remain and that are disturbed or damaged by construction, shall be restored to their original condition or better, at the Contractor's expense, and to the satisfaction of the Project Manager.

.2 Debris and unacceptable materials resulting from the construction Works must be disposed of off site, at an appropriate waste disposal site, at the Contractor's expense.

.3 Existing trees, shrubs, and herbaceous vegetation which have been damaged by construction work shall be restored by pruning, and/or fertilizing, replaced or compensated for, as directed by the Project Manager, at the Contractor's expense.

.4 Cut material shall be disposed of through removal, chipping or burying in keeping with the plans and Specifications, and as directed by the Project Manager.

.5 Any disturbed areas by construction outside the limits of construction shall be restored to their original conditions at the Contractor's expense, and to the satisfaction of the Project Manager.

END OF SECTION

PART 1.0 GENERAL

1.1 DESCRIPTION

General Requirements:

.1 This section describes the supply of all labour, materials, tools, services and incidentals to do all site clearing, stripping and removal of existing surfaces and structures, as shown on Contract drawings and as required to permit in installation of new Work by other trades, and the removal of rubble and debris from the site for disposal.

.2 Related Work Specified Elsewhere:
Section 01 14 13: Site Protection and Access
Section 31 22 13: Earthworks
Section 32 11 23: Granular Base Course

.3 Provide for the co-ordination of and the disconnection and capping of services, such as:

1. Electrical power connections and service
2. Water

.4 Obtain and pay for any special permits.

.5 Complete demolition and removal of all materials above and below grade, as indicated on the Contract Drawings.

.6 The Contractor is to make safe and/or leave in a safe condition the area of his respective Work.

1.2 STANDARDS

.1 To Ontario Fire Code, Part 8, Demolition, including not limited to:

1. Shutting off and capping services
2. Management of combustible salvage, waste and rubbish
3. Protection of persons and property
4. Maintenance of fire access
5. Provision of fire extinguishing equipment
6. Maintenance of existing and/or temporary exits

.2 To CSA S350-M80 'Code of Practise for Safety in Demolition of Structures, the Ontario Occupational Health and Safety Act, and regulations of authorities having jurisdiction.

1.3 QUALITY ASSURANCE

.1 Requirements of Regulatory Agencies:
Work of this section shall include protection measures, consisting of materials, constructions and methods, required by jurisdictional authorities to save persons and property from harm.

1.4 SITE EXAMINATION

.1 Verify all site conditions, which affect the Work of this Section, and immediately report, in writing, all discrepancies and conditions which are at variance with the Contract drawings and Specifications and could adversely affect the performance of this Section.

.2 Failure to do the above will imply acceptance of all conditions by the Contractor.

.3 Claims thereafter, on account of damages or extra costs resulting from such discrepancies will be rejected, unless they are the direct result from such conditions which could not be ascertained before commencement of Work.

.4 Existing utility locations shown on Contract drawings for information only. Verify on site all underground and above ground services, whether shown on Contract drawings or not and be fully responsible for locating and staking of said services on the site by public utilities companies. Verify also with City's maintenance and operations department with respect to the City's service.

.5 The Project Manager does not assume any responsibility for the accuracy and completeness of the documentation of such services and where shown on the Contract drawings.

1.5 PROTECTION

.1 Ensure that adjacent private and public properties, both within and without the premises, are protected from damage resulting from Work of this Section. Install protection consisting of fences, hoardings, braces, railings, warning signs, visual and audible signals, barricades, and substantial constructions providing physical protection. Property shall include but not be limited by, structures, and their finishes and appurtenances; site improvements; trees, planting and landscaping; furnishings, fixtures, hardware and equipment.

.2 Prevent movement, settlement, or collapse of adjacent services, sidewalks, driveways, trees, fencing, building or building parts.

.3 Protect existing services from damages. If necessary, relocate active services to ensure that they function continuously in safety and without risk of damage. Cap off and remove unused services encountered during demolition after approval is

given by the utilities or Jurisdictional Authorities, whichever may apply, and the Project Manager.

.4 Maintain security of areas in which demolition is proceeding by control of access through hoardings, enclosing fences, and barricades during times Work is in progress, and by locking hardware otherwise.

.5 Prevent spread of dust beyond the demolition area by wetting, or by other approved means, as it accumulates.

.6 Keep sidewalks, streets, and highways free of dust and debris from demolition Work. Clean up accumulations as they occur.

.7 Remove protections and barricades only if and when directed.

.8 Immediately repair damage to trees, bench marks, structures, buried and above-ground services, and survey monuments should it occur as a result of this Section.

.9 Be responsible for damages of any kind and making good to the Project Manager's approval.

PART 2.0 PRODUCTS

2.1 MATERIALS

.1 Use materials required to replace or make good existing Work that match existing materials in all details.

PART 3.0 EXECUTION

3.1 DEMOLITION

.1 Be responsible to obtain permission to enter, before starting Work.

.2 Carry out demolition in a systematic manner as necessary to accommodate remedial, reconstruction or new Work.

.3 Remove existing materials and features where shown on Contract Drawings and where existing work conflicts with new Work.

.4 Remove surfaces to full depth, including granular base courses.

.5 All concrete footings that are removed must be backfilled and compacted with native soil prior to covering over with proposed finishing materials.

.6 Remove surfaces only to extent of private property lines and structures and where shown to facilitate new Work.

.7 Pavement, structures, curbs, etc. slated for removal which are adjacent to existing pavement to remain, shall be neatly and accurately saw cut prior to removal.

.8 Small pieces of concrete and masonry may be used to back fill with the written permission of the Project Manager. Do not use organic or metallic materials for back fill.

.9 At the end of each Work day, leave site in a safe condition so that no part is in danger of collapse. Do not stack salvaged materials or debris liable to overload any part of the structure.

.10 Remove organic, metallic, contaminated or dangerous materials from the site and ensure safe disposal.

.11 Service Connections for Retention: Clearly paint, mark and post warning signs on lines to remain in service and promptly repair any damage to maintain active service.

3.2 CLEARING

.1 Clear and remove all debris, asphalt, concrete, rocks, boulders and other useless materials within the Project boundaries where necessary for the installation of new Work.

.2 Burying of useless materials on the site is not permitted.

.3 Burning of useless materials shall not be permitted.

3.3 SALVAGE

.1 Carefully dismantle items containing materials directed or indicated for salvage. Stockpile salvaged materials at locations directed or indicated.

.2 Salvage existing traffic signs, and other signs if required for re-installation.

.3 Salvage existing lighting if required for hand over to the City's.

.4 Safely store for re-use, or hand over to the City's any items identified on the Contract Drawings as "salvageable" or to be "salvaged". Store salvaged items in area designated by City.

.5 Remove footings and clean posts ready for re-installation.

.6 Disconnect and stub off electrical cables.

.7 Properly backfill holes of removed concrete footings with matching backfill materials, surface materials and to match finished grade to the satisfaction of the Project Manager.

3.4 DISPOSAL

.1 Remove completely from the site all debris resulting from demolition, except for specified salvage and debris used as specified to fill voids below grade.

.2 Remove debris daily, immediately as it accumulates.

.3 Do not overload trucks and otherwise take means to prevent spillage during travel.

.4 Legally disposes of waste materials at certified Waste Management sites and assumes all cost of disposal.

.5 Do not sell at site, materials from demolition.

.6 Notify the City immediately of any contaminated or dangerous materials.

.7 Dispose of contaminated or dangerous materials immediately, and under the most stringent guidelines set out by the Ministry of Environment and to minimize all dangers.

3.5 COMPLETION AND CLEANING

.1 Keep sidewalks, roadways, parking lots, streets, and highways free of dust and debris from demolition Work. Clean up accumulations as they occur.

.2 Clean exposed surfaces and adjacent areas ready for reconstruction operations.

.3 Remove tools, equipment, trash, dust and dirt from the site of operations and leave in a broom clean condition.

.4 Remove protections, barricades and other temporary construction on completion of demolition, except those to be maintained in place protecting access to open areas below grade and new construction Work.

3.6 REPAIRS

.1 Repair and make good all property damaged by the Contractor during demolition which was due to negligence on the part of the Contractor at no extra cost to the Contract and to the approval of the Project Manager.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies site clearing, rough grading, excavation and backfilling, including demolition and removal Work shown on the Contract drawings.

1.2 QUALITY ASSURANCE

.1 The Contractor shall arrange for compaction tests to City of Hamilton requirements. Please see the City's Construction and Materials Specification Manual (latest edition), **Form 900** for compaction requirements.

.2 Costs for testing shall be borne by the City of Hamilton directly.

.3 Testing shall be completed by qualified independent inspection and testing laboratory.

.4 Provide adequate notice to permit scheduling of testing operations. Ensure Work is ready for testing procedures. Tests shall be conducted on the basis of 1 test for every 50m^2 (540 Sq. Ft.) in general fill areas and one (1) test for every 10m (32') in trenches per every 0.6m (2') of depth.

.5 Field measurements and field reports shall be submitted to the Project Manager within 24 hours of testing.

.6 Final measurements and reports shall be submitted to the Project Manager for review within 5 business days of testing.

.7 All earthworks must be carried out to the standards of the City's Construction and Material Specifications Manual, latest edition.

.8 The Project Manager reserves the right to complete their own inspection and/or testing by an independent inspection and testing agency. The independent inspection and testing Company shall be responsible only to the Project Manager and shall make only such inspections or tests as the Project Manager may direct.

Review of construction by the Project Manager and inspection and/or testing by an independent Inspection and Testing Agency, is to ascertain general conformity with Contract Documents. It does not relieve the Contractor of its contractual responsibilities.

The review is based on representative samples of the Work and does not relieve the Contractor from carrying out its own quality control and making the Work inconformity with the drawings and Specifications.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Stockpile topsoil or construction materials in locations designated by the City.

1.4 SHORING AND BRACING

.1 Shore and brace all excavations sufficiently to prevent caving in and to support existing structures, roads or services.

.2 Ensure shoring is in accordance with local municipal and provincial regulations and obtain all necessary permits.

.3 Erect warning signs and protective barriers in accordance with local municipal and provincial regulations.

.4 Make good any damage and be liable for any injury resulting from inadequate shoring or bracing.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 **General fill material:** clean, free from debris, organic matter and other deleterious material as approved by the Project Manager. Fill materials shall not have any contaminants in excess of the criteria as indicated in Table A, Residential/Parkland Land Use of the Ministry of Ontario *Guidelines for Use at Contaminated Sites in Ontario* (rev. Feb. 1997), Appendix 2, as amended.

.2 **Granular fill material:** as called for on the drawings and conforming in all respects with OPSS.MUNI 1010.

PART 3.0 - EXECUTION

3.1 DEMOLITION, SITE CLEARING AND REMOVALS

.1 Clear the site of all pavements, curbing, vegetation, and any other landscape elements which interfere with the Work as indicated on the Contract Drawing. Remove and dispose of debris off site.

.2 All existing trees and shrubs are to remain unless specifically noted to be removed. Cut down trees designated to be removed and remove stumps to a depth of 600mm below proposed finished grade. Remove and dispose of all wood and chips off site, fill hole with topsoil if in landscape area or clean fill if in paved area, unless shown otherwise on the Contract drawings.

.3 Removal includes granular base course material to existing sub-grade unless approved by the City for re-use on the site.

.4 Remove material without damaging adjacent pavements which are to remain. Make clean, sharp saw cut before starting removal Work. Be responsible for making good damaged surfaces.

.5 Remove other materials and surfaces as indicated on the Contract drawings.

.6 Temporarily remove any existing fences as required to facilitate new construction Work. Re-install at the completion of construction to as new condition.

3.2 ROUGH GRADING

.1 Where necessary strip topsoil, screen, and stockpile as directed. Remove all stones, clay clods and debris exceeding 50mm in dimension. Do not handle topsoil when saturated.

.2 Cut back areas that are to be lowered to the grades shown on the Contract Drawings, allowing for the placement of topsoil and/or specified materials. Obtain the written approval of the City before using excavated material as fill. Prior to placing fill material, scarify the existing grade to a minimum depth of 75mm (3").

.3 Where existing grade is to be raised, supply and place fill material approved by the City in progressive 150mm (6") lifts (loose material depth). Compact each lift as per Form 900 of the City's Construction and Material Specification Manual (latest edition) before placing subsequent layers.

.4 Provide finished rough grade parallel to finished grade, allowing for the placing of the specified surface material and base and to a tolerance of plus or minus 50mm (2"), and compact before placing subsequent layers. Compact based on final surface treatment as per **Form 900** of the City's Construction and Material Specification Manual (latest edition).

3.3 GENERAL EXCAVATION

.1 Stake out the locations of all items requiring excavation and obtain the approval of the City before commencing Work.

.2 Dispose of excavated material off site unless it is approved for use as fill material or backfilling material by the City.

.3 Excavate to the elevations and dimensions indicated or required for construction Work. All depths detailed are shown depth after compaction.

.4 Obtain the approval of the City of all excavations before proceeding with construction activities.

.5 Where bearing capacity of the subsoil appears to be insufficient, obtain the written approval of the City to have soil investigations carried out. Costs for such testing, if required, will be paid by the City, at cost.

.6 Excavation exceeding the amounts shown on the Contract Drawings, if authorized in writing by the City, will be paid as extra to the Contract price in accordance with the General Conditions. Quantities will be calculated in place. Truckload measurement is not acceptable.

.7 Correct unauthorized excavation at no extra cost.

3.4 SHAPING AND BLENDING

.1 All proposed Works are to be integrated and blended into the existing landscape terrain in a uniform and smooth manner to the satisfaction of the Project Manager.

.2 Unless shown otherwise on the Contract Drawings, the following guidelines shall be observed:

a. all earthworks shall be fine graded to allow the placement of sod or other specified paving materials such that the sod/paving materials meet the finish level of adjacent walkways, slabs, top of curbs, etc.

b. integrate new curbs and walkways to existing grades gently matching the lay of the land and meeting existing conditions with a smooth transition. Round top and bottom of slopes. Cut in new sod to existing grass where applicable.

c. Maximum slopes of berms and steep slopes shall be 1:4 (25%).

d. Maximum slopes of tie-ins to curbs and walkways shall be 1:10 (10%) for a minimum distance of 2.0m.

e. Swales shall have gently rounded top and bottom transitions.

f. All park grades must permit easy cutting from ride on grass cutting mowers.

3.5 SURFACE DRAINAGE

.1 The Contractor shall not impede the existing surface drainage with the new Work. If surface drainage flow is going to be affected, notify the Project Manager and request direction on how to proceed.

END OF SECTION

PART 1 - GENERAL

1.1 DESCRIPTION

.1 This Specification covers the requirements for the supply and installation of granular materials for multi-use court paved areas and asphalt pathways as specified. Most of the Work will require the Contractor to add a base granular course over undisturbed ground or compacted sub-grade.

1.2 RELATED WORK SPECIFIED ELSEWHERE

.1 Section 31 22 13 - Earthworks
Section 32 12 16 - Asphalt Concrete Paving

1.4 QUALITY CONTROL

.1 The Contractor shall arrange for compaction tests to City of Hamilton requirements. Please see the City's Construction and Materials Specification Manual (latest edition), **Form 900** for compaction requirements.

.2 Costs for testing shall be borne by the City of Hamilton directly.

.3 Testing shall be completed by qualified independent inspection and testing laboratory.

.4 Provide adequate notice to permit scheduling of testing operations. Ensure Work is ready for testing procedures. Tests shall be conducted on the basis of:

a. 1 test for every 200m^2 in multi-use court.
b. 1 test for every 200 m^2 of asphalt pathway.

.5 Field measurements and field reports, and delivery ticket information shall be submitted to the Project Manager within 24 hours of the asphalt arriving to site. Copies of the delivery tickets shall be submitted to the Project Manager.

.6 Final measurements and reports shall be submitted to the Project Manager for review within 5 business days of testing.

.7 All granular base Work must be carried out to the standards of the City's Construction and Material Specifications Manual, latest edition.

.8 The Project Manager reserves the right to complete their own inspection and/or testing by an independent Inspection and Testing Agency. The Independent Inspection and Testing Company shall be responsible only to the Project Manager and shall make only such inspections or tests as the Project Manager may direct.

Review of construction by the Project Manager and inspection and/or testing by an independent Inspection and Testing Agency, is to ascertain general conformity with Contract documents. It does not relieve the Contractor of its contractual responsibilities.

The review is based on representative samples of the Work and does not relieve the Contractor from carrying out its own quality control and making the Work inconformity with the Contract drawings and Specifications.

PART 2.0 – PRODUCTS

2.1 MATERIALS

.1 Aggregate: Crushed Limestone Granular “A”, “B”, “C”, as specified in Form 600 of the City’s Construction and Material Specification Manual (latest edition). Compaction requirements are specified in Form 900 of the City’s Construction and Material Specification Manual (latest edition).

PART 3.0 - INSTALLATION

3.1 STAKEOUT AND PREPARATION

.1 Stake out location of area designated for asphalt paving.

.2 Prior to excavation, obtain approval of stake out location from the Project Manager. Contact two (2) days in advance for approval of stake out.

.3 Strip existing sod and native topsoil (if present) in area designated for paving and remove from site or distribute to site if not in a finished condition.

.4 Excavate areas designated for paving to depth as shown on Contract Drawings.

.5 Remove and dispose of excess excavated material from site. Retain enough topsoil to repair and blend areas subject to disturbance at no additional charge.

.6 Set out Work to lines and levels shown on Contract Drawings. Maintain such lines and levels.

.7 Shape areas to receive aggregate to required depth.

3.2 SUB-GRADE

.1 Check sub-grade for stability and condition and report to Project Manager any problems or imperfections prior to assuming sub-grade for use as an access route or other purpose.

.2 Ensure sub-grade is compacted as per Form 900 of the City's Construction and Material Specifications Manual (latest edition).

.3 Ensure that sub-grade preparation conforms to levels and compaction required to allow for installation of granular base.

.4 Soft or unstable areas shall be removed, filled with stable granular materials, compacted and tested as deemed required by the Project Manager.

3.3 GRANULAR SUB-BASE

.1 Exercise due care at all times to prevent granular materials from becoming contaminated by clay and topsoil or other types of deleterious materials.

.2 Place materials immediately following sub-grade approval by the Project Manager and as follows:

- To required width and thickness in layers not exceeding 150 mm (6") compacted thickness for Granular "B" and "C" and 100 mm (4") for Granular "A".
- Compact granular sub-base as specified in Form 900 of the City's Construction and Material Specifications Manual (latest edition).
- Sprinkle materials with water when required to obtain optimum compaction.
- Use only water methods for dust control.
- Grade, shape and compact surface of uppermost layer of granular material to produce required contour of surface.
- Finished surface shall not deviate more than 30 mm.
- Surface shall not deviate more than 10mm (1/2") at any pace on a 3m (10ft) template.
- Ensure no ponding occurs on finished surfaces.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies asphalt paving, tack coat, and pavement markings.

1.2 STANDARDS

.1 In this specification, C&MSM refers to the City of Hamilton Public Works Construction & Materials Specifications Manual.

.2 OPSS refers to the Ontario Provincial Standard Specification.

.3 The C&MSM takes precedence over the OPSS.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Store granular materials in areas designated by the Project Manager.

.2 Minimum temperature of asphalt shall be 135°C immediately after spreading and prior to rolling.

1.4 JOB CONDITIONS

.1 Do not commence paving operations unless the surface temperature is steady at, or rising above 2°C.

.2 Proceed with paving operations only during favourable weather conditions and on a dry base.

.3 Suspend all paving operations if the temperature drops below 2°C.

.4 Spread subsequent paving courses within 12 hours after spreading and compaction of the previous course.

.5 Where existing asphalt paving is to receive resurfacing, ensure that all areas of cracked or broken asphalt are removed and patched satisfactorily with new asphalt prior to proceeding with resurfacing operations.

.6 Protect all adjacent areas and structures, particularly planted areas, from contamination by asphalt materials. Make good all damage.

1.5 QUALITY ASSURANCE

.1 The Contractor must have a minimum of 5 years' experience in asphalt paving work.

.2 Plants providing asphalt paving mixture under this Contract must conform to OPSS 1150.

.3 Spreading equipment must meet the requirements of OPSS 310 and the City's Construction and Material Specifications Manual (latest edition).

.4 All asphalt paving Work must be carried out to the standards of OPSS 1150 and the City's Construction and Material Specifications Manual, latest edition.

.5 The Contractor shall arrange and pay for compaction, thickness, extraction/gradation, and mix compliance tests to City of Hamilton requirements. Please see the City's Construction and Materials Specification Manual (latest edition).

.6 Costs for testing shall be borne by the City.

.7 Testing shall be completed by qualified independent inspection and testing laboratory.

.8 Provide adequate notice to permit scheduling of testing operations. Ensure work is ready for testing procedures. Tests shall be conducted on the basis of:

a. 1 test for every 200m^2 in multi-use court.
b. 1 test for every 200 m^2 of asphalt pathway.

.9 Field measurements, field reports, and delivery ticket information shall be submitted to the Project Manager within 24 hours of the asphalt arriving to site. Copies of the delivery tickets shall be submitted to the Project Manager.

.10 Final measurements and reports shall be submitted to the Project Manager for review within 5 business days of testing.

.11 The Project Manager reserves the right to complete their own inspection and/or testing by an independent Inspection and Testing Agency. The Independent Inspection and Testing Company shall be responsible only to the Project Manager and shall make only such inspections or tests as the Project Manager may direct.

Review of construction by the Project Manager and inspection and/or testing by an independent Inspection and Testing Agency, is to ascertain general conformity with Contract documents. It does not relieve the Contractor of its contractual responsibilities.

The review is based on representative samples of the Work and does not relieve the Contractor from carrying out its own quality control and making the Work inconformity with the drawings and specifications.

.12 It is the Contractor's responsibility to ensure that asphalt cement, asphalt primer and asphalt emulsion conform to the standards set out in the drawings and specifications.

1.6 INSPECTION

.1 Stake out paving locations and obtain approval from the Project Manager before proceeding.

.2 Obtain approval from the Project Manager of the finished sub-grade before proceeding.

.3 Obtain approval from the Project Manager of the paving base before proceeding.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 Granular A, B, C & D: granular material conforming in all respects to C&MSM, OPSS 314, and OPSS 1010.

.2 Coarse and Fine aggregates: Conforming in all respects to C&MS.

.3 Mineral filler: finely ground particles of limestone, hydrated lime or other mineral dust approved by the Project Manager, free of clay, silt and other deleterious material, conforming to C&MSM Form 800.

.4 Asphalt cement: conforming in all respects to C&MSM and OPSS 1101.

.5 Joint painting material: slow setting asphalt emulsion, type SS-1 conforming to OPSS 1103 and 1152.

.6 Pavement paint: an acrylic emulsion type "traffic" paint conforming to CGSB 1-GP-74, to be white, unless otherwise noted.

2.2 MIXES

.1 Paving mixture: a hot mix, hot laid, asphaltic concrete, of the type specified and installed to the minimum compacted thickness shown on the Contract Drawings and composed of coarse and fine aggregates, mineral filler, and asphalt cement uniformly mixed, conforming to C&MSM Form 800.

.2 HL-3a mix asphalt to be used for all multi-use and pickleball court paving

.3 HL-3 mix asphalt to be used for all park pathways

2.3 TACK COAT

.1 In addition to OPSS 310, as amended, the following shall apply:

This item shall include all costs to clean the laid asphalt and to supply and place the tack coat to the asphalt surface.

PART 3.0 - EXECUTION

3.1 PREPARATION

.1 Fine grade subgrade eliminating uneven areas and filling low spots. Remove all debris. Excavate all soft and unstable areas in subgrade and backfill with Granular A.

.2 Compact finished subgrade in accordance with the C&MSM Form 600 and 900.

.3 Where existing asphalt is to be resurfaced, clean all surfaces of soil, dust, leaves or other debris prior to paving. Ensure surface is free of standing water.

3.2 INSTALLATION

.1 Spread the specified granular materials in horizontal layers not exceeding 150mm loose depth and compact in accordance with C&MSM. In areas where compaction by roller is not possible, compact with approved mechanical or hand tamping devices to the specified density.

.2 Ensure that granular does not become contaminated by deleterious material.

.3 Build up thickness of each material to the minimum compacted thickness as specified on the Contract Drawings.

.4 Correct all irregularities or depressions resulting from rolling and compact until the granular surface is smooth, uniform, and true to line and grade.

.5 Where applicable, paint all curbs, gutters, walls, vertical faces of existing pavement, and all structures in actual contact with the new asphalt with a sealing coat of SS-1 emulsion. Provide a closely boned, watertight joint.

.6 Lay and spread all paving courses by means of approved equipment.

.7 Immediately after spreading and screeding, check the surface and correct all irregularities before compacting.

.8 Ensure all joints are straight, clean, vertical and free of broken or loose materials. Paint the vertical surfaces of all joints with thin, continuous coating of type SS-1 emulsion.

.9 Compact each paving course, with approved rolling equipment, as per C&MSM. Begin compaction operations as soon as possible after placement when asphalt will bear the weight without checking or undue displacement. Keep roller wheels moist so as not to pick up material. Keep all equipment clean and in good condition.

.10 Hand tamper with hot tampers in areas not accessible to rolling equipment.

.11 Hand tamper all edges adjacent to grass or planting beds to a 45° angle. Establish straight edge by the use of a string line. Where edge is not straight, lay in a smooth curve to the radii indicated. Where finished edge is not satisfactory, at the option of the Project Manager, the edge may be repaired by saw cutting to a 45° edge to the required line. Cut edge must be painted with liquid asphalt.

.12 After final rolling, surfaces shall be smooth and true to the specified grade and crown, with the thickness of the courses varying no more than 6mm from that shown on the Contract Drawing. At the option of the Project Manager, unsatisfactory surface roughness on the asphalt may be corrected by the application of a coat of hot liquid asphalt at the Contractor's expense.

.13 Ensure a minimum surface slope of 1.5% or as specified towards catch basins, or as shown on the Contract Drawings.

.14 Ensure the surface is free from depressions greater than 3mm under a 3m straight edge.

3.3 PAVEMENT MARKINGS

.1 Where applicable, at the completion of asphalting operations, apply the pavement markings where indicated on the Contract Drawings.

.2 Avoid splashing or spattering paint on the surface.

.3 Multipurpose Court lines shall be white and 50mm wide as follows:

a) Side lines and end lines – layout court dimensions to the inside of the 50mm line
b) Basketball key, circles, 3-point line and goal creases – layout dimensions to the outside of the 50mm line
c) Hockey goal line – game side of the line in line with goal posts

3.4 PROTECTION

.1 No traffic shall be permitted on the finished pavement until it has cooled to atmospheric temperature. Provide all necessary barriers, signs and watch guards as required.

.2 Protect wet paint until fully dried.

.3 Repair any damage to pavement or markings prior to final inspection.

3.5 CLEAN-UP

.1 At the completion of asphalt operations and prior to final inspection, clean adjacent landscape areas, all curbs, catch basins, manhole covers, walls, and other structures to remove contamination by asphaltic or other materials resulting from the Work.

END OF SECTION

PART 1.0 – GENERAL

1.1 DESCRIPTION

.1 The supply and placement of rock shall be executed in accordance with the plans and details of the Contract Drawings under the direction of the Consultant.

1.2 RELATED SECTIONS

1.3 QUALITY ASSURANCE

.1 Source Limitations for Stone: Obtain stone units through one source from a single quarry pit to ensure consistent density, colour and grain. The quarry shall have adequate capacity and facilities to meet the specified requirements.

.2 Contractor to provide only skilled stone masons with a minimum of five years' experience in similar satisfactory installations, supervised by foreman experienced in type of work specified.

.3 Provide adequate, acceptable equipment and labour forces to carry out the work expeditiously.

.4 Stone shall be supplied by a source approved by the Owner.

.5 Stone shall be standard grade, sound and uniform in quality, texture, and strength, and shall free of flaws, reeds, rifts, laminations, cracks, seams, starts, or other defects which may impair its strength, durability, or appearance. Exposed surfaces shall be free from spots, spalls, chips, stains, discoloration, or other defects which would affect its appearance.

.6 Color, texture, and finish shall be within the range of samples approved by the Owner.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Handling

.1 Pack and load stone units for shipment and unloading at site in a manner to prevent damage.

.2 Use no material for backing of packaging that would stain or discolour exposed surfaces of the stone.

.3 Isolate stone from contact with ground and other materials until laid in final location, to prevent staining.

.4 Lift stone with proper and sufficiently long slings or forks with protection provided so they are not damaged.

.5 Protect edges and corners to prevent damage.

.2 Storage:

.1 Stack stone on timbers or platforms at least 80mm above grade.

.2 Provide necessary means to prevent staining of stone during storage.

.3 Place polystyrene or other plastic film between wood and other finished surfaces of stone when stored for an extended period of time.

.4 Cover stored stone units if exposed to the weather for an extended period of time.

.5 Do not use salt to thaw ice formed on surface of stone units.

1.5 SITE MOCK-UP

.1 Construct samples to meet project requirements. Select stone units to represent maximum texture and colour variations. Sample to be a minimum of 2.4m in length and reviewed on-site. Sample may not be able to be incorporated into finished Work and includes all saw-cuts and required finishes.

.2 Do not begin masonry Work until mock-up seat wall is approved by Project manager. Approved sample shall represent minimum standard of quality for project stone Work.

1.6 SUBMITTALS

.1 Prior to purchasing and supplying stone to the site, the Contractor shall provide samples for the Consultant’s review and approval, along with the name and location of the proposed supplier.

.2 Submit samples of stone at various sizes, showing finishes and colour specified.

.3 Stone samples shall fully demonstrate colour, shade, veining, texture, range, and finish.

4. Provide quarry certification that all stone supplied conforms to this specification.

1.7 PROTECTION OF WORK

.1 During stone installation, cover exposed tops of exterior stone work with heavy waterproof sheeting at end of each day's work. Cover partially completed

structures when Work is not in progress. Extend cover a minimum of 600 mm down both sides and hold cover securely in place.

PART 2.0 – MATERIALS

2.1 ARMOURSTONE

.1 Stone to be Eramosa, Flamborough or approved equal. Natural stone layers to run horizontal.

.2 Stone size varies. see drawing and details for dimensions and layout. Height tolerance of stones to be =/-13mm:

Wall stone: 0.8m wide, 1.0m long, and 0.7m high stones.

.3 Stone to be flat and consistent. Stone to be light-grey in colour. Sample to be approved by consultant prior to purchasing and supplying stone to the site.

.4 Stone to be split face on all exposed sides including top, front, back and bottom. All butt joints to be saw cut to ensure max. 5mm gap between butt stones.

.5 All exposed surfaces to be appropriate for children to sit and climb on. All sharp edges to be tooled smooth.

PART 3.0 – EXECUTION

3.1 GENERAL

.1 Lay stone in accordance with good practice, CSA A371-94, Section 04050, and as accepted in mock-up sample.

.2 Verify dimensions on site and make minor adjustments to suit site conditions and to City's approval.

.3 Do not set stone on surfaces or with materials containing frost when ambient temperatures are below 5 degrees C.

.4 Clean stone before setting by scrubbing with fiber brushes followed by a thorough drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh fillers or abrasives. Before setting all stone to be clean and free of ice and frost.

.5 Set stone in accordance with drawings. Provide anchors, supports, fasteners, and other attachments shown, specified or necessary to secure stonework in place in accordance with the best practices of the trade. Shim and adjust accessories as required for proper setting of stone. Completely fill holes, slots and other sinkages for anchors, dowels, fasteners, and supports with non-shrinking, non-staining mortar during setting of stones.

3.1 INSTALLATION OF BOULDERS AND ARMOURSTONE

.1 Refer to details on Contract Drawings for all associated excavation, bedding material, materials and installation requirements associated with Work of this section.

.2 The installation of fieldstone shall conform to OPSS 511 and Contract details. Boulder and armourstone materials for the various treatments to be installed following intent of plan and details.

.3 Install materials to depths, lengths and sections indicated in plans and as directed by the Project Manager on site. Correlate subgrade depths with depths of surface treatments specified in applicable sections.

.4 Protect existing installations from damage and restore if required.

.5 Do not allow any petroleum-based fillers or sealants to come into contact with stonework.

.6 Keystone boulders (>500mm) may be placed roughly by machine, but locations and grades must be refined by an experienced machine operator or by hand. Keystone lines shall be sloped into the centre of the channel, with the lowest points graded to allow concentration of low stream flows. Placement of boulder keystones and verification of critical elevations (i.e., step-crests) shall be subject to direction and approval by the Project Manager.

3.3 CLEANING AND PROTECTION

.1 Adjustment and Cleaning:

.1 Upon completion, clean all exposed-to-view surfaces of markings, dust, dirt, excessive mortar and grout, grease and other contamination.

.2 Replace all damaged or marred material and work as directed at no cost to the Owner.

.2 Protection:

.1 The Contractor shall obtain, from the installer, advice on the proper procedures required to protect the stonework from deterioration, discoloration or damage during construction and until acceptance of the Work. Contractor shall implement all necessary procedures required to protect completed stonework from damage

.2 Protect until inspection, approval and acceptance of entire Project Work.

.3 Make good any settlement that may occur and be responsible for the repair of all damages.

.4 Protect corners and edges of stone units that are vulnerable to damage by continuing construction. Protect them by means of wood or other rugged materials secured in a manner that will not damage or stain finished surfaces.

.5 Remove protection when risk of damage is no longer present and without damage to stone.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the supply and installation of concrete formwork.

.2 Related works elsewhere:

a.	Cast-in-place concrete	Section 03 30 00
B.	Concrete reinforcement	Section 03 20 00

1.2 QUALITY ASSURANCE

.1 Provide a system of quality control to ensure that the grades and minimum standards specified herein are attained.

.2 All formwork shall be approved by the Project Manager prior to the pouring of concrete.

.3 Bring to the attention of the Project Manager any defects in the Work or departure from the Contract Documents which may occur during Construction. The Project Manager will decide upon corrective action and state their recommendations in writing.

1.3 STANDARDS

.1 Perform Work to the following standards and requirements, as applicable.

.2 In this specification, C&MSM refers to the City of Hamilton Public Works Construction and Materials Specifications Manual.

.3 OPSS refers to the Ontario Provincial Standard Specification.

.4 The C&MSM takes precedence over the OPSS.

.5 Requirements of Regulatory Agencies:

a. CAN/CSA A23.1/A23.2 - Concrete materials and methods of concrete construction/Test methods and standard practices for concrete
b. CSA O121 - Douglas Fir Plywood
c. CSA S269.1 – Falsework and Formwork
d. CAN/CSA-S269.3 – Concrete Formwork
e. CAN O86 - Engineering Design in Wood
f. CSA O151 - Canadian Softwood Plywood

1.4 TOLERANCES

.1 Perform forming operations and place hardware so that finished concrete will be within the tolerances set out in CAN/CSA A23.1/A23.2.

.2 These tolerances are acceptable with regard to visual and structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

1.5 DESIGN OF FORMS AND RESHORING

.1 Design forms and reshoring to safely support vertical and lateral loads until they can be supported by the structure.

.2 Design formwork for loads and lateral pressures recommended in ACI 347R.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 Formwork Lumber: plywood and Work formwork materials specified standard. May use prefabricated steel forms free of dents and deformations for exposed concrete. Used formwork may be used for surfaces which will be concealed.

.2 Form Ties: removable or snap-off metal ties, fixed or adjustable length, free of devices leaving holes larger than 25 mm diameter in concrete surface, formed to break 25mm (1") from surface of concrete after form removal, with minimum working strength of 13 kN. Wire ties shall not be used.

.3 Form Liner: Plywood: high density overlay Douglas Fir.

.4 Form Release Agent: chemically active release agents containing compounds that react with free lime in concrete resulting in water insoluble soaps.

.5 Form Stripping Agent: colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Syabolt Universal 15 to 24 mm^2/s at 40° C, flash point minimum 150°open cup.

.6 Falsework Materials: to CSA S269.1.

PART 3.0 - EXECUTION

3.1 FORMWORK

.1 Verify lines, levels, column centres, and all dimensions before proceeding with formwork. Design, erect, support, brace and maintain formwork to safely support vertical and lateral loads until they can be supported by the structure.

.2 Erect formwork to standard in this specification except where indicated otherwise. Do not leave lumber in concrete. Clean formwork in accordance with CAN/CSA A23.1/A23.2 before placing concrete.

.3 Construct forms to produce finished concrete conforming to shape, texture, dimensions, locations, and levels indicated within tolerances required by CAN/CSA A23.1/A23.2. Set anchor bolts, templates, steel connection units or other inserts into the forms and secure them rigidly so that they do not become displaced during concreting.

.4 Align form joints and make watertight. Keep form joints to minimum.

.5 Use 1" chamfer strips on external corners of beams, joints and columns.

.6 Apply release agent by spray in accordance with manufacturer's recommendations. Ensure surfaces of form receive uniform coating.

.7 All concrete Work exposed to view, Contractor to follow indicated pattern on Contract Drawings for tie rod locations and joints in formwork. In the absence of drawing, centre pattern on wall and make all joints equal in length and height. Obtain approval from the Project Manager for location and details of construction joints not shown.

.8 Design, erect, maintain and remove all temporary Works required. Coordinate such work with the Project Manager. Provide temporary bracing, supports and/or other installations necessary to maintain plumbness, true alignment and stability of the structure and all its parts throughout all erection stages.

.9 Form footing sides unless footings are shown to be placed against undisturbed soil.

.10 Sleeves, Chases, and Formed Openings

a. Form chases slots, openings, drips, recesses, expansion and control joints as indicated.

b. All openings, sleeves, recesses are not necessarily shown on the structural drawings nor are their sizes or locations shown. Refer to architectural, mechanical and electrical drawings for openings and sleeving requirements not show, located and dimensioned on the structural drawings.

c. No sleeves, chases and openings through structural members shall be formed without the Project Manager's approval.

d. Where pipes or services pass throng walls or slabs, from the openings by an approved sleeve or form as necessary, except where such openings are specified to be formed or sleeved by the appropriate trade. Form chases or recesses as shown or required.

.11 Leave formwork in place for a minimum of 5 days following the placement of concrete.

3.2 STRIPPING FORMWORK

.1 Forms may be removed after three days from date of placing concrete.

.2 Be responsible for safety of structure, both before and after removal of forms until concrete has reached its specified 28 day compressive strength.

3.3 NOTIFICATION

.1 Prior to commencing significant segments of the Work, give the Project Manager and independent inspection and testing agencies appropriate notification so as to afford them reasonable opportunity to review the Work. Failure to meet this requirement may be cause for the Project Manager to classify the Work as defective.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the supply and installation of concrete reinforcement.

.2 Related Works elsewhere:

a.	Concrete formwork:	Section 03 11 00
b.	Cast-in-place concrete	Section 03 30 00

1.2 QUALITY ASSURANCE

.1 Provide a system of quality control to ensure that the depths and minimum standards specified herein are attained.

.2 The Contractor shall coordinate with the Project Manager for inspection of the concrete reinforcement.

.3 Costs for inspections shall be borne by the City of Hamilton directly.

.4 Provide adequate notice to permit scheduling of inspection operations. Ensure Work is ready for inspection procedures.

.5 Field measurements and reports shall be submitted to the Project Manager prior to the pouring of concrete.

.6 Final measurements and reports shall be submitted to the Project Manager for review within 5 business days of inspections.

.7 All concrete Work must be carried out to the standards of the City's Construction and Material Specifications Manual, latest edition (unless otherwise noted in the Contract Drawings).

.8 Bring to the attention of the Project Manager any defects in the Work or departure from the Contract Documents which may occur during Construction. The Project Manager will decide upon corrective action and state their recommendations in writing.

1.3 STANDARDS

.1 Perform Work to the following standards and requirements, as applicable.

.2 In this specification, C&MSM refers to the City of Hamilton Public Works Construction & Materials Specifications Manual (latest edition).

.3 OPSS refers to the Ontario Provincial Standard Specification.

.4 The C&MSM takes precedence over the OPSS.

.5 Do falsework in accordance with CSA S269.1, except where specified otherwise.

.6 Conform with the requirements of the Ontario Building Code, latest edition, and the following:

a. A.C.I. 315R - Manual of Standard of Practice for Detailing Reinforced Concrete.
b. CAN/CSA A.23.1/23.2 - Concrete materials and methods of concrete construction/Test methods and standard practices for concrete
c. CAN/CSA-A.23.3 - Design of Concrete Structures for Buildings, Canadian Standards Association.
d. CAN/CSA-G30.18 - series of standards for Concrete Reinforcement, Canadian Standards Association.
e. CSA W186 - Welding of Reinforcing Bars in Reinforced Concrete Construction
f. C.R.S.I. Recommended Practice for Placing Reinforcing Bars, latest edition.
g. OPSS 1442 - Material Specification for Epoxy Coated Reinforcing Steel Bars for Concrete
h. OPSS.MUNI 1440 – Material Specification for Steel Reinforcement for Concrete
i. OPSS.MUNI 905 – Construction Specification for Steel Reinforcement of Concrete.
j. R.S.I.C. Reinforcing Steel Manual of Standard Practice.

k. R.S.I.O. Manual of Standard Practice.

Where the above standards disagree, the strictest requirements shall govern, except as specified otherwise herein.

1.4 TOLERANCES

.1 Perform fabrication and setting so that completed Work will be within the tolerances set out in this Specification.

.2 These tolerances are acceptable with regard to structural requirements. Interfacing tolerances may not be compatible with the above. Review and coordinate interfacing tolerances so that the various elements come together properly.

1.5 SUBMITTALS

.1 Shop Drawings for Reinforcement:

1. Prepare reinforcement placing drawings and bar lists taking into account all openings and recesses.

2. Prepare placing drawings in a clear complete manner that will permit placing of reinforcement to be performed without reference to Contract Drawings. Do not reproduce the structural drawings.

3. Detail reinforcement in accordance with the Contract Documents, and these specifications.

4. Except as noted otherwise on the drawings, provide standard hook on reinforcement.

5. Amongst other items, indicate the following:

    a. Bar Sizes
    b. Spacing
    c. Location and quantities of reinforcing
    d. Mesh
    e. Chairs
    f. Spacers
    g. Hangers

6. Identify each bar with a code mark corresponding to the bar lists.
   Indicate minimum clearances between reinforcement and minimum concrete protection to reinforcement.

7. Identify epoxy coated reinforcement.

8. Indicate location and embedment of dowels.

9. Indicate location, number and type of support accessories, including support bars suitably sized and space to rigidly support the weight of reinforcement and construction loads.

.2 Certificates

1. Steel of Canadian Manufacture: Mill test certificates properly correlated to the reinforcement used for fabrication. Test shall show physical and chemical analysis, minimum 5 weeks prior to commencing reinforcing Work.

2. Steel of other than Canadian Manufacture: Test data that each size and grade of reinforcement proposed meets specification requirements. Reinforcement approved for use by the Project Manager shall be identified in a manner suitable to the Project Manager. Only steel that has been approved will be accepted on Job Site.

.3 Substitutions

1. Substitution of different size bars permitted only upon written approval of Project Manager.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Stockpile construction materials in locations designated by the City.

.2 Deliver materials to job site in dry condition. Keep materials dry until use.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 Reinforcement: Deformed steel to these standards and to the material specification shown on the Contract Drawings.

If not specified on the drawings, the following specifications shall be used:

a. Bars: Conform to OPSS 1442 and OPSS.MUNI 1440. Reinforcement grade of 400.
b. Welded Steel Wire Fabric: Conform to OPSS.MUNI 1440
c. Deformed Steel Wire: Conforming to CSA W186

.2 Epoxy Coating for Reinforcement: An electrostatic application of epoxy protective coating conforming to OPSS 1442.

.3 Welded Wire Fabric: As per the standards in this specification. Flat sheets only.

.4 Support Accessories:

1. Chairs, bolsters or spacers of sufficient strength to rigidly support the weight of reinforcement and construction loads.

2. Cold-drawn annealed steel tie wires and support accessories for epoxy coated reinforcement shall be epoxy coated.

.5 All reinforcing material shall be clean and free of dirt, oil, loose rust, and any other coating that would reduce bond.

.6 Metal ties and anchors: to CSA S304.

PART 3.0 - EXECUTION

3.1 NOTIFICATION

.1 Prior to commencing significant segments of the Work, give the Project Manager and independent inspection and testing agencies appropriate notification so as to afford them reasonable opportunity to review the Work. Failure to meet this requirement may be cause for the Project Manager to classify the Work as defective.

3.2 DEFECTIVE MATERIALS AND WORKMANSHIP

.1 Where factual evidence exists, that defective workmanship has occurred or that Work has been carried out incorporating defective materials, the Project Manager may have tests, inspections or surveys performed, analytical calculation of structural strength made, and the like, in order to help determine whether the Work must be replaced. Tests, inspections or surveys carried out under these circumstances will be made at the Contractor's expense, regardless of their results, which may be such that, in the Project Manager's opinion, the Work may be acceptable.

.2 All testing shall be conducted in accordance with the requirements of the Ontario Building Code, except where this would in the Project Manager's opinion cause undue delay or give results not representative of the rejected material in place. In this case, these tests shall be conducted in accordance with the standards given by the Project Manager.

.3 Materials or workmanship which fail to meet specified requirements may be rejected by the Project Manager whenever found at any time prior to final acceptance of the Work regardless of previous inspection. If rejected, defective materials or Work incorporating defective materials or workmanship shall be promptly removed and replace or repaired to the satisfaction of the Project Manager, as no expense to the City.

3.3 FABRICATION

.1 Fabricate reinforcing in accordance to the standards in this Specification.

.2 Identify with a metal tag each bar with code mark corresponding to that appearing on bar list.

.3 Bend reinforcement once only and at room temperature. Do not straighten or re-bend reinforcement. Do not use bars with kinks or bends not shown on Contract drawings.

.4 Replace bars which develop cracks or splits.

3.4 PLACING

.1 Place reinforcing steel as indicated on approved shop drawings and in accordance with CAN/CSA A23.1/A23.2.

.2 Prior to concreting, place reinforcement, support and secure against displacement. Tolerances shall be non-cumulative.

.3 Conform to requirements shown for concrete cover to reinforcement:

a. Surfaces poured against ground: 80 mm
b. Formed surfaces exposed to ground or weather: 50 mm
c. Formed wall surfaces not exposed to ground or weather: 25 mm
d. Formed bean or column surfaces not exposed to ground or weather: 40mm

.4 Place reinforcement accurately and secure against displacement by using annealed iron wire ties or clips, or otherwise specified, at intersections. Tack welding of reinforcement to secure in place will not be permitted.

.5 Secure reinforcement in walls using sufficient spacers on each face to maintain the requisite distance between reinforcement and wall face and so that vertical bars are plumb. Provide a minimum of 10 mm diameter spreader bars spaced at 2m centers in both directions.

.6 Do not drive or force reinforcement into fresh concrete.

3.5 FIELD BENDING

.1 Do not field bend reinforcement except where indicated or authorized in writing by Project Manager.

.2 When field bending is authorized, bend without heat, applying a slow and steady pressure.

.3 Replace bars which develop cracks or splits.

3.6 EPOXY COATED REINFORCING

.1 Provide epoxy coated reinforcing in all concrete exposed to de-icing chemicals including all framed slabs and exterior walls adjacent to walkways, whether or not covered with waterproof finishes.

.2 All systems for handling, transporting and storing coasted bars shall be such that the coating shall not be damaged. Bar to bar abrasion and excessive sagging shall be prevented. Bars shall not be dropped or dragged and shall be stored on suitable non-metallic supports.

.3 During and after the installation of the bars into their location in the deck, the Contractor shall repair all damaged portions of the coating with patching material. Any damaged accessories shall also be repaired.

.4 All damaged areas of the coated reinforcing steel and metallic accessories shall be repaired before any rusting occurs. At their discretion, the Project Manager may require any damaged bars to be replaced instead of being repaired. If infrequent and small damaged areas do rust, the rust shall be completely removed by approved method before the areas are repaired.

.5 Splices shall only be provided where shown on the Contract Drawings. No other splices will be permitted without written approval of the Project Manager. The cutting of coated bars by burning will not be permitted. The placing of the concrete shall be controlled such that the coating of the reinforcing steel is not damaged.

.6 The welding of coated bars shall not be permitted.

3.7 WELDED WIRE FABRIC

.1 Where no reinforcement is shown, provide 152 x 152 W13.3.7/W13.3 (8/8) welded wire fabric at mid depth in slabs on grade or walks or toppings 60 mm in thickness or greater. Supply welded wire fabric in flat sheets.

.2 Overlap ends and sides of fabric not less than 150 mm.

.3 Ensure wire fabric is supported in place with appropriate support accessory.

3.8 CONSTRUCTION JOINTS

.1 Obtain approval from the Project Manager for locating and details of construction joints not shown.

.2 Continue reinforcement through the joint in its normal position. Add additional reinforcement across the joint as shown or directed.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies placement, finishing and joint fillers for cast-in-place concrete.

.2 Related works elsewhere:

a.	Concrete Formwork:	Section 03 11 00
b.	Concrete Reinforcement:	Section 03 20 00

1.2 QUALITY ASSURANCE

.1 Provide a system of quality control to ensure that the depths and minimum standards specified herein are attained.

.2 The Contractor shall coordinate with the Project Manager concrete slump, temperature, cast air content, and strength (cylinder) tests. Please see the City's Construction and Materials Specification Manual (latest edition).

.3 Costs for testing shall be borne by the City of Hamilton directly.

.4 Testing shall be completed by qualified independent inspection and testing laboratory.

.5 Provide adequate notice to permit scheduling of testing operations. Ensure Work is ready for testing procedures. Tests shall be conducted on the basis of:

.6 Field measurements, field reports, and delivery ticket information shall be submitted to the Project Manager within 24 hours of the concrete arriving to site. Copies of the delivery tickets shall be submitted to the Project Manager.

.7 Final measurements and reports shall be submitted to the Project Manager for review within 5 business days of testing.

.8 All concrete Work must be carried out to the standards of the City's Construction and Material Specifications Manual (latest edition) (unless otherwise noted in the Contract drawings).

.9 Bring to the attention of the Project Manager any defects in the Work or departure from the Contract Documents which may occur during Construction. The Project Manager will decide upon corrective action and state their recommendations in writing.

1.3 STANDARDS

.1 Perform Work to the following standards and requirements, as applicable.

.2 In this specification, C&MSM refers to the City of Hamilton Public Works Construction and Materials Specifications Manual.

.3 OPSS refers to the Ontario Provincial Standard Specification.

.4 The C&MSM takes precedence over the OPSS.

.5 Requirements of Regulatory Agencies:

a. CAN/CSA A.23.1/A23.2 - Concrete materials and methods of concrete construction/Test methods and standard practices for concrete
b. CAN/CSA-A.23.3 - Design of Concrete Structures for Buildings, Canadian Standards Association.

Where the above standards disagree, the strictest requirements shall govern, except as specified otherwise herein.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 Concrete Materials: Conform to standards specified above, except as specified otherwise.

.2 Steel Reinforcement (if applicable): See Section 03 20 00.

.3 Cement Dispersing Agent: Conform to ASTM C494/C494M, Pozzolith by Master Buildings Ltd., or WRDA by W.R. Grace & Co. Ltd, or approved equal.

.4 Acrylic/Latex Additive:

Acrylic or Latex or combination additive to increase the flexural and tensile strength of concrete, as manufactured by Alvert Chemical Co. Ltd., W.R. Meadows of Canada Ltd., or Sika Canada Limited, or approved equal.

.5 Joint Filler: Premoulded bituminous impregnated fibre type, 12mm thickness to full depth of slab, conforming to ASTM D1751, latest edition.

.6 Asphalt expansion joint in sidewalk: conforming to ASTM D994/D994M.

.7 Porous Fill (under slab on grade): As per C&MSM.

.8 Non-Shrink Grout: Non-shrink Grout: premixed compound consisting of non-

metallic aggregate, Portland cement, water reducing and plasticizing agents, of pouring consistency, capable of development compressive strength of 32 MPa at 28 days.

.9 Waterstops: Extrusions of plasticized PVC low temperature compound to sizes and shapes required for complete watertight performance, by W.R. Meadows of Canada Ltd, W.R. Grace and Co. of Canada Ltd., or J.E. Goodman Sales Ltd. Where casting against existing concrete, use Volclay waterstop by CETCO or approved equal.

.10 Formwork and falsework: Per specification Section 03 11 00.

.11 Form stripping agent: colourless mineral oil, free of kerosene, with viscosity between 70 and 110 s Satbolt Universal, 15 to 24 mm2/s at 40 degrees c, flashpoint minimum 150 degrees c, open cup.

.12 Metal ties and anchors: to CSA S304.

2.2. MIXES

.1 Design the mix, including ready-mixed, in accordance with CAN/CSA A23.1/A23.2, the C&MSM (latest version), and as follows:

a. Cement Type: Normal Portland cement, Type 10 to C&MSM, Form 700.

b. Compressive Strength: As indicated on Contract drawings. Unless otherwise indicated, the concrete strength shall be 32 MPa.

c. Class of Exposure: Conform to Table 2 of CAN/CSA A23.1/A23.2.

d. Coarse Aggregate: According to C&MSM, Form 700.

e. Slumps: Maximum and minimum slumps at point of discharge shall be 80 +/- 20mm for foundation walls, slab on pans, footings and slabs on compacted fill; 100 +/- 80mm for columns, reinforced slabs and 50 +/- 20mm for pavements and concrete topping. Design concrete so that material will not segregate, and excessive bleeding will not occur.

f. Air Content: To meet the requirements of Tables 2 and 4 of CAN/CSA A23.1/A23.2 according to class of exposure, 5 - 7for concrete exposed to freeze and thaw cycle.

g. Cement Dispersing Agent: Use cement dispersing agent for increased workability of mix, in accordance with manufacturer’s directions.

h. Maximum and Minimum Mass of Air Dry Concrete: For normal mass concrete, 190 kg/m.

i. Concrete for Mechanical and Electrical Work: In accordance with CAN/CSA A23.1/A23.2, air entrained with 5 - 7% air content if exterior, ASTM C260/C260M, 37.5mm max. size of aggregate, 15 MPa compressive strength, unless otherwise indicated on Drawings.

PART 3.0 - EXECUTION

3.1 GENERAL

.1 Read Specifications in conjunction with Contract drawings. Contract Drawings are not to be scaled. Before proceeding check all dimensions shown on Contract drawings.

.2 Typical details shown on the Contract Drawings shall govern the Work.

.3 Removal includes granular base course material to existing sub-grade unless approved by the City for re-use on the site.

.4 Layout all the Work prior to any excavation and receive Project Manager's approval before commencing excavation. Receive Project Manager's approval at each stage of construction before proceeding to the next stage.

.5 Do not place concrete during or prior to rain. If rain occurs after placing and before initial set of concrete, cover with waterproof, non-staining covering material until set.

.6 When concrete is placed in temperatures lower than 4°C, or likely to be lower than 4°C, protect the freshly placed concrete from freezing by adequate coverings (e.g. tarpaulins) and insulation if required and the addition of heat. Concrete, when placed, shall have a temperature of not less than 16°C, nor more than 32°C for first 4 days, and minimum 10°C for following 2 days. No salt or other chemical will be allowed in the mix to reduce the freezing point of the concrete.

.7 When ready-mixed (mixed in transit) concrete is used, the discharge of the concrete shall be complete within a period of 1 hour after the mixing water has been added to the dry material, except when concrete materials are heated, in which case this period shall be reduced to 30 minutes. All concrete delivered at air temperature below 4°C shall have a temperature at the Work of not less than 16°C or more than 32°C.

3.2 EXCAVATION

.1 Excavation and foundation Work shall conform to the current edition of the Ontario Building Code Section 4.2 as well as 31 22 13 and SP211.

.2 Underside of all exterior Work (footings, beams, etc.) shall be protected against frost action by not less than 4'-0" of the earth or equivalent at all times.

.3 Do not disturb soil within the branch spread of trees or shrubs that are to remain. If excavating through roots, excavate by hand and cut all roots with a sharp handsaw or chain saw. Seal cuts with approved tree wound dressing. Where excavation results in the loss of more than 20% of the root system of any tree, have the plant material top pruned by a qualified arborist to compensate for root loss. Pay all costs incurred.

3.3 CONCRETE PLACEMENT

.1 Ensure reinforcement and inserts are not disturbed during concrete placement.

.2 Prior to placing of concrete obtain Project Manager's approval of proposed method for protection of concrete during placing and curing in adverse weather.

.3 Maintain accurate records of poured concrete items to indicate date, location of pour, quality, air temperature and test samples taken.

.4 In locations where new concrete is dowelled to existing Work, drill holes in existing concrete. Place steel dowels and pack solidly with non-shrink grout to positively position and anchor dowels.

.5 Set sleeves, ducts, pipes or other openings as indicated or specified elsewhere.

.6 Do not eliminate or displace reinforcement to accommodate hardware. If inserts cannot be located as specified, obtain approval of all modifications from Project Manager before placing of concrete.

3.4 FINISHING

.1 Finish concrete in accordance with CAN/CSA A23.1/A23.2. Refer honeycombed areas to the Project Manager for inspection and repair or replace if instructed to do so.

.2 Bring the surfaces of all exposed concrete to a smooth rubbed finish not later than 5-6 hours after removal of forms and in accordance with CAN/CSA A23.1/A23.2.

.3 The producing of smooth surfaces by means of cement plaster will not be permitted unless otherwise specified or scheduled.

.4 Make good all temporary openings left in concrete work for pipes, conduit, ducts, shoring and other such Work during construction using a mix or mortar of the same proportions as the surrounding Work, reinforced with wire mesh as required, and finish to match surrounding Work. Carry out patching as specified in C&MSM.

.5 Protect concrete and other Work from marking and other damage. Until set, the Contractor is expected to remain on site to ensure that no vandalism occurs during the initial curing stage.

END OF SECTION

PART 1.0 - GENERAL

1.1 SCOPE OF WORK

.1 Supply all materials, equipment and labour needed to supply and install the chain link fence as shown on the Contract Drawings.

1.2 QUALITY ASSURANCE

.1 The Contractor must have a minimum of five (5) years' experience in the installation of chain link fences for sports fields, courts, and park boundary.

1.3 REFERENCE STANDARDS

.1 This Specification refers to the following standards, Specifications or publications:

Ontario Provincial Standard Specifications, Construction:
OPSS 904 Concrete Structures
Ontario Provincial Standard Specifications, Material:
OPSS 1350 Concrete (Materials and Production)

U.S. Federal Specification:

FF-T-791b May 2, 1967 - Turnbuckle
Canadian General Standards Board:
CAN2-138.1-M80 - Fence, Chain Link, Fabric
CAN2-138.2-M80 - Fence, Chain Link, Framework Zinc Coated Steel
CAN2-138.4-M82 - Fence, Chain Link, Gates

Canadian Standards Association:

CSA-G162.1-M1977 - Methods of Determining Mass of Coating on Zinc-Coated (Galvanized) Steel Wire
CSA-G164-M1981 - Hot Dip Galvanizing of Irregularly Shaped Articles
CSA-W59-M1989 - Welded Steel Construction (Metal Arc Welding)
CSA-G164-M - Turnbuckles

.2 In this specification, C&MSM refers to the City of Hamilton Public Works Construction & Materials Specifications Manual.

1.4 DEFINITIONS

.1 For the purpose of this specification the following definitions shall apply:

Fence Post: An upright tubular or fabricated steel member for supporting fencing material.

Line Posts: Fence posts spaced at regular intervals between terminal posts throughout each stretch of fence.

Terminal Posts: Fence posts which include end, gate, corner and straining posts.

End Posts: Fence posts positioned at the ends of a stretch of fence.

Gate Posts: The two fence posts forming a gateway.

Corner Posts: Fence posts positioned at corners and changes or direction greater than ten degrees.

Straining Posts: Fence posts positioned at changes in grade greater than thirty degrees.

Top Rail: A tubular or fabricated steel section continuously joined by means of sleeves or couplings throughout each stretch of fence extending between terminal posts.

Brace Rail: A tubular or fabricated steel section used for bracing terminal posts.

Diagonal Brace Wire: Wire used for bracing terminal posts.

Top Wire: Wire installed at the top of fence and extending throughout each stretch of fence between terminal posts.

Bottom Wire: Wire installed at the bottom of fence and extending throughout each stretch of fence between terminal posts.

Fittings: Mechanical connections of various designs, shapes and metals to join fence components into an integral structure.

Wire Ties: Wire that is used to tie chain link fence fabric to line posts, bottom wires and top rails or top wires.

Knuckled: The type of selvage obtained by interlocking adjacent wire ends, in pairs and then bending the wire ends back into a closed loop.

Barbed: The type of selvage obtained by interlocking adjacent wire ends, in pairs and then twisting the wire at least 2 turns with the wire ends above the twist.

Barbed Wire: Twisted longitudinal wires, termed line wires, to which the barbs are attached.

Non Shrink Cement Grout: Means a bedding compound that is inert and free from shrinkage.

PART 2.0 - PRODUCTS

2.1 CONCRETE

.1 Concrete mix shall be designed to produce 20 MPa minimum compressive strength at 28 days and containing 20 mm maximum size, 5 mm minimum size coarse aggregate, with water/cement ratio to CAN3-A23. l-M77 Table 7 for Class A exposure and 60mm slump at time and point of deposit. Air entrainment to CAN3-A23. 1-M77 Table 8 (latest edition). Concrete mixed on site will not be accepted unless approved in writing by the Project Manager prior to use.

2.2 FENCING MATERIALS

.1 All materials to be new and of the highest quality in every respect and shall conform strictly to this specification. All materials shall be delivered to the site bearing the manufacturer's stamp or tag or other identification as to the size, weight, gauge and quality.

.2 **Chain Link Fence Fabric**

Chain link fence fabric shall conform to CAN2-138.1-M.

Fence fabric shall be the full widths as indicated on the Contract Drawings, details, and Specifications and shall be installed without overlaps.

Fence fabric width shall be as indicated on the Contract Drawings, details, and Specifications and shall be uniform 38mm diamond pattern chain link mesh knuckled top and bottom. Diamond size in accordance with details and special provisions. The fence wire shall be one of the following types:

1. Class A, Zinc Coated, Style 2 Medium steel wire, hot-dip galvanized after weaving.

2. Class B, Vinyl Coated, Style 2 Medium steel wire, galvanized before weaving. The vinyl coating shall be black in colour.

   or

3. Type 1 Steel Fabric 3.0 mm dia. steel wire, Class B Vinyl Coated, Style 3 Light steel wire, galvanized before weaving. The vinyl coating shall be black in colour.

Site specific fence requirements shall be as described on the Schedule of Prices for each location.

Fabric shall conform to ASTM designation A 392 (or latest edition).

.3 **Posts, Rails, and other Pipe:**

1. All posts, rails and other pipe shall be powder coated in black, galvanized steel pipe standard butt-welded Schedule 40, ASTM designation A 120. No tubing conduit or open-seam material will be accepted.

2. All posts shall be fitted with a non-decorative cap, designed to provide watertight fit, fasten securely over the posts, and carry the top rail or top wire as specified.

3. All posts shall be supplied in the lengths and sizes detailed and shall be sufficiently long to allow for the footings as detailed.

.4 **Tension Wires:**

1. Bottom tension wire shall be #6 gauge I.W.G. (5 mm), galvanized or heavier single strand galvanized steel wire. Top wires and diagonal wire brace shall be #6 gauge I.W.G. (5mm) galvanized or heavier single strand galvanized steel wire.

2. Top and bottom wires shall be zinc-coated with not less than 488 g/m2 or not less than 92 g/m2 when vinyl coated wires are used. The mass per unit area of zinc coating shall conform to CSA G162.1-M. Vinyl coated top and bottom wires shall match the colour of the vinyl coated fence fabric.

3. Fasteners shall be #9 gauge I.W.G; (3.5 mm) galvanized steel or aluminum wire, conforming to the requirements for chain-link fabric except that non-corrosive or galvanized steel bands will be permitted for fastening the fabric to the posts and frame. Fasteners of an approved type made of #16 gauge I.W.G. (1.5 mm) stainless steel will be permitted as an equivalent to the #9 gauge I.W.G. (3.5 mm) galvanized steel or aluminum wire for fastening the fabric to the tension wires.

4. Tie wire fasteners: single strand, galvanized steel wire, #6 gauge I.W.G. (5 mm) diameter.

.5 **Tension Bars and Bands:**

1. Tension bars shall be 5 mm x 19 mm minimum galvanized steel or heavier.

2. Tension bar bands: 3 mm x 19 mm minimum galvanized steel or 5 mm x 19 mm minimum aluminum.

.6 **Fittings and Hardware:**

1. Fittings and hardware are to be cast aluminum alloy or galvanized steel. Turnbuckles are to be drop forged conforming to the U.S. Federal Specification FF-T-791b Type 1, Form 1, class 4, and shall be galvanized conforming to CSA

G164-M.

.7 **Welding:**

1. All welding shall be in accordance with C.S.A. W59 (latest edition). Welded joints shall be ground smooth and treated with an approved rust inhibiting paint and two coats of galvanized paint.

2. Welded joints are required wherever indicated on the Contract Drawings and wherever in the opinion of the Project Manager standard couplings and fittings are not adequate.

2.3 FINISHES

.1 **Galvanizing:**

1. Zinc coatings shall be smooth and continuous, shall adhere tenaciously to the base metal and shall be free from blisters, bare spots, projections or other defects not consistent with good galvanizing practice.

2. The mass of zinc coatings shall meet the requirements of the following Table when tested in accordance with C.S.A. 0 162.1 (latest edition).

Component	mass g/m^2	Preece Dips
Fabric and Wire	610	6
Posts and Rails	550	6
Frames and Braces	550	6
Cast Fittings	610	6
Other Fittings	610	6

.2 **Paint:**

1. Zinc pigmented paint: to CGSB l-GP-178 Ma (or current edition).

2. Black vinyl coating for all black vinyl chain link fencing to be installed

PART 3.0 - EXECUTION

3.1 PREPARATION AND EXAMINATION

.1 Investigate location of underground services and subdrains in area of fence to avoid interference and damage. Notify Project Manager prior to start of installation in case of conflict.

.2 Remove debris and correct ground undulations along fence line to obtain smooth uniform gradient between posts.

.3 Stake out and obtain the approval of the Project Manager of fence location and elevations before proceeding.

3.2 ERECTION OF FENCE

.1 The Contractor shall ensure that all posts and rails are properly laid out in accordance with the locations shown on Contract Drawings, and with equal horizontal distances unless otherwise shown.

.2 Erect fence along lines indicated, plumb, level, free of kinks and buckles and with posts accurately aligned.

.3 Misplaced or mis-aligned posts shall be removed and reset; bending or other adjustment of posts by hand winches, vehicles or any other means to achieve the desired alignment or location is strictly forbidden.

.4 Excavate post holes minimum 255 mm diameter and 1220 mm deep (4') below finished grade, by methods approved by Project Manager. Bulb bottom of holes for all corner and end posts and for intermediate posts at maximum 60.0 m along fence line. Hand excavate around all utility lines. Maximum spacing for the posts shall be 3050mm on centre. Fence posts shall be plumb in both directions.

.5 Place concrete in post holes then embed posts into concrete to minimum 1000 mm. depth. Unless details show otherwise, extend concrete 50 mm above ground level and slope to drain away from posts. Form top 105 mm of post foundation; rub smooth and round edges of exposed concrete. Brace to hold posts in plumb until concrete has set.

.6 For footings in concrete, non-shrink cement grout shall be placed to ensure that the posts are set to the specified grade.

.7 All posts in solid rock or where overburden is less than 450mm, holes for posts shall be drilled in the rock to a minimum depth of 380mm with the diameter 25mm greater than the outside diameter of the post. The annular space around the post shall be filled with non-shrink cement grout.

.8 Horizontal deflections of 10 degrees or more shall be considered as corners with corner posts installed.

.9 Do not install fence fabric until the concrete footings are fully cured for a period of not less than five (5) days.

.10 Install horizontal brace between posts and nearest line post, placed in centre of panel. Install braces on both sides of corner and straining posts in similar manner. Straining posts shall be installed at equal intervals not exceeding 150 m. Additional straining posts shall be installed where changes in vertical alignment exceed 30 degrees.

.11 Install top rail between posts and fasten securely to terminal posts and secure waterproof caps.

.12 Install bottom rail as above. Bottom of fence fabric shall be set at ±50mm (2") above the proposed finished grade.

.13 Lay out fence fabric and stretch tightly to tension recommended by manufacturer. Fasten to end, corner and straining posts with tension bar secured to post with tension bar bands spaced at 300 mm intervals. Knuckled self-edge top and bottom. Provide minimum 25 mm and maximum 50 mm clearance between bottom of fence and grade. The longitudinal axis of the diamond configuration shall be perpendicular to the slope of the pipe rail.

.14 The fabric shall be placed on the side of the post nearest the roadway, if applicable, with barbed edge at top.

.15 Secure fabric to top rails and bottom tension wire with tie wires at minimum 450 mm intervals, and to line posts at 360mm intervals. Give tie wires minimum two twists.

.16 Restore grading disturbed by fencing installation to original condition.

3.3 WELDING

.1 Were indicated on drawings, all joints are to be continuously welded, ground smooth and treated with an approved rust inhibiting primer.

.2 The Contractor shall remove all burrs and projections from field welding or other origin so that they are smooth and without hazard.

3.4 TOUCH UP

.1 Repair damaged galvanized surfaces. Clean damaged surfaces with wire brush removing loose and cracked coatings. Apply two coats of approved zinc pigmented paint to damaged area.

.2 Repair any damaged concrete footing caps/ surfaces for consistent slope away from post.

3.5 TOUCH UP

.1 Clean and trim areas disturbed by operations. Dispose of surplus material and replace damaged turf with sod as directed by the Project Manager.

3.6 MEASUREMENTS

.1 Actual measurement: measurement will be made in metres, following the contour of the ground, of the actual length of fence erected and shall include gate openings.

.2 Plan Quantity: measurement is by plan quantity, as may be revised by Adjusted Plan Quantity, for the horizontal length, in metres, along the centre line of the fence, including gate openings. Where the slope of chain link fence is 10% or greater, than the slope length will be used in the measurement.

END OF SECTION

PART 1.0 - GENERAL

1.1 DESCRIPTION

.1 This section specifies the supply and placing of topsoil and cultivated sod.

1.2 QUALITY ASSURANCE

.1 The Contractor must have five (5) years' experience in sodding Work.

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver sod to site within 24 hours of being harvested and lay sod within 48 hours thereafter, depending on suitable weather conditions and in accordance with good horticultural practice.

.2 Deliver, unload, and store on pallets. Schedule deliveries in order to keep storage at job site to a minimum without causing delays.

.3 Small irregular or broken pieces of sod will not be accepted.

1.4 INSPECTION

.1 Obtain the approval of the Project Manager of the finished topsoil surface before proceeding with sodding.

1.5 ACCEPTANCE

.1 It is the Contractor's responsibility to maintain the sod in good condition until acceptance of all the Work of the entire Project.

.2 At the time of acceptance the grass must be not more than 65mm high. Minimum acceptable cutting height is 45mm.

.3 Acceptance will be given when the sod is properly rooted, free of bare and dead spots and reasonably free of weeds in the opinion of the Project Manager.

.4 Replace any deteriorated sod with new sod at the direction of the Project Manager.

1.6 TOPSOIL TEST

.1 The Contractor shall test all imported topsoil and soil amendments from all proposed sources. Testing shall be conducted before and after any soil amendments are added to topsoil to ensure that the soil falls within the guidelines under 2.1.2 below.

.2 Collect one (1) topsoil sample from each pile to be tested and provide to the testing

lab according to the following guidelines:

a) each sample shall be min. one (1) litre in volume
b) obtain ¼ litre sample at a minimum of four different locations within the main body of the pile and thoroughly mix together to create the 1 litre sample for testing.
c) label each sample with the name of the project and location of the soil sample.

.3 Arrange and pay for testing to be carried out by:

- Agri-Food Laboratories, 1-503 Imperial Rd. N., Guelph, Ont., N1H 6T9, 1-800-265-7175, tel: (519) 837-1600, fax: (519)837-1242, www.agtest.com,
- A&L Canada Laboratories Inc., 136 Jetstream Rd, London, Ont. N5V 3P5, tel: (519) 457-2575, fax: (519) 457-2664, email: alcanadalabs@alcanada.com
- or an approved equal independent testing company.

.4 Conduct a Basic Topsoil Test from each proposed source which includes: Soil Texture (% Sand, % Silt, % Clay), Total Salts, Organic Matter, pH, Bph, available Nitrogen, Phosphorus, Potassium, Magnesium, Calcium, CEC, Chloride, Sodium, and SAR. If topsoil source is from a former farm field, also conduct a test for Atrazene. Obtain recommendations for amendments and the quantities and type of fertilizers needed to eliminate the deficiencies made evident by the testing.

.5 Submit the results of soil testing and fertiliser recommendations to the Project Manager for approval before commencing with the Work.

.6 If the topsoil source is exhausted do not use topsoil from a new source until it has been tested and approved for use.

.7 Provide topsoil results at least 2 weeks prior to delivery to the site.

PART 2.0 - PRODUCTS

2.1 MATERIALS

.1 **Native Topsoil:** Existing topsoil found on the site, stripped, screened, and stockpiled for re-use in this Contract.

.2 **Imported Topsoil**: a fertile, friable, natural loam (A horizon layer), capable of sustaining vigorous plant growth, free of subsoil contamination, roots and stones over 50mm diameter, reasonably free of weeds (as determined by the Project Manager), and falling within the following guidelines:

Soil Texture Range:	**loam to sandy**	**clay loam**

(OMAFRA soil texture triangle)	**loam**	
pH range:	5.5 to 7.9	5.5 to 7.9
Total Salts (mmhos/cm)	less than 1.5	less than 1.5
Organic Matter (%)	4% to 15%	4% to 15%
N - Nitrogen (ppm)	See below	See below
P - Phosphorus (ppm)	10 – 60	10 – 60
K - Potassium (ppm)	80 – 250	80 – 500
Mg - Magnesium (ppm)	100 – 300	100 – 600
Ca - Calcium (ppm)	1000 – 4000	1000 – 7000
Na - Sodium (ppm)	less than 200	less than 200
Cl - Chloride (ppm)	less than 100	less than 100
SAR - Sodium Absorption Rate	less than 15	less than 15

Nitrogen: Provide the required amount of nitrogen as identified in the soil test report.

.3 **Fertilizer**: Prior to sodding, the fertilizer is to be broadcast and worked into the soil. The nitrogen application should be split, 9 kilograms per hectare now and 4 to 6 kilograms top dressed after the grass has emerged. Heavier or more applications may be required in weak areas.

Recommended Establishment Treatment:

N	P	K	Mg	Zn	
77	156	336	22	4	kilograms per hectare

Or as determined by the soil test report.

.4 **Grass Sod**: Certified No. 1 grade cultivated turf grass sod with a composition of 50% Kentucky Blue Grass and 50% Blue Cultivar either "Flyking" or "Baron", or as specified on the drawings, grown and sold in accordance with N.S.G.A. classifications. At the time of sale, it must have a strong fibrous root system and be free of stone and burned or bare. Contractor is responsible for notifying supplier with sufficient advance notice to ensure the required quantities are available at the time required to maintain construction schedules. Any delays, due to lack of sod and related costs shall be payable by the Contractor.

.5 **Sod Pegs**: 25mm x 25mm x 230mm (minimum length). Ensure pegs are long enough to securely anchor sod.

PART 3.0 - EXECUTION

3.1 PREPARATION OF EXISTING GRADE

.1 Grade soil, eliminating uneven areas and low spots, ensuring positive drainage.

.2 Remove debris, roots, branches, stones in excess of 50 mm diameter and other deleterious materials from the existing grade. Remove soil contaminated with calcium chloride, toxic materials and petroleum products. Remove debris which

protrudes more than 75 mm above surface. Dispose of removed material off site.

.3 Scarify the approved dry, un-frozen sub-grade to depth of 50 - 100 mm. Cross cultivate those areas where equipment used for hauling and spreading has compacted soil.

.4 Dispose of excavated material on site as directed, so as not to contaminate any topsoil or imported soils used for hauling and spreading has compacted soil.

3.2 FERTILIZING

.1 Mix fertilizer with imported topsoil or cultivate to a minimum depth of 150mm to mix fertilizers and spread topsoil.

3.3 SPREADING OF TOPSOIL

.1 Place topsoil after Project Manager has accepted subgrade.

.2 Spread topsoil in uniform layers not exceeding 150 mm, over unfrozen subgrade free of standing water over scarified subgrade.

.3 Spread topsoil to a minimum 150mm depth after settlement and a compaction of 80% S.P.D.

.4 Manually spread topsoil around trees, structures, shrubs and obstacles.

3.4 FINE GRADING OF TOPSOIL

.1 Grade topsoil to eliminate rough spots and low areas and ensure positive drainage.

.2 Prepare loose friable bed by means of cultivation and subsequent raking.

.3 Topsoil shall be placed to a grade which allows sod to be installed at the final lines and levels as indicated on the Contract Drawings.

.4 Provide a finished topsoil surface that is smooth and firm against footprints, with a fine, loose texture before sod is placed.

.5 Project Manager will inspect topsoil in place and determine acceptance of material, depth of topsoil and finish grading.

3.5 INSTALLATION OF SOD

.1 Lay sod with tight butt joints. Do not leave any open joints or overlap adjacent pieces of sod. Alternate joints on each row of sod. Ensure finished sod surface is flush with adjoining grass areas, pavement or top surface of curbs.

.2 On slopes steeper than 4:1, lay sod perpendicular to the slope and peg each row at intervals of not more than 600mm on each side of the sod strip. Drive pegs flush with surface of sod.

.3 During dry weather, protect sod from drying and water sod as necessary to ensure its vitality and prevent dropping of sod in handling. Dry sod will be rejected.

.4 Sod is to be laid in a continuous fashion. No isolated areas of sod, which are to be integrated with the main portion of sod, will be accepted.

3.6 SOD WATERING

.1 Immediately after installation, water the sod with sufficient quantity of water to penetrate the sod and the top 50mm of the underlying topsoil.

.2 The Contractor shall be responsible for the initial watering of the sod immediately after the sod is laid. If the Contractor takes more than one day to lay the sod, they will be responsible for keeping the sod laid the previous day(s) in a moist condition until the Contract is completed. The Project Manager will not give acceptance and take responsibility for watering the sod until both sodding and Contract are completed and have been accepted.

.3 All watering shall be done with a spray application. An open-end hose will not be accepted. The method of watering shall meet the approval of the Project Manager.

.4 When sod has dried sufficiently to prevent damage, roll all sodded areas to ensure a good bond between sod and topsoil. Provide close contact between sod and soil by means of a light roller. Heavy rolling to correct irregularities in grade is not permitted.

3.1 CLEAN-UP

.1 At the completion of sodding and prior to final inspection, remove all surplus materials and debris from the site at no extra cost.

.2 Repair all damages resulting from sodding operations at no extra cost.

3.8 SOD MAINTENANCE

.1 The Contractor shall water, cut and maintain sod for 30 consecutive days after placement to ensure root establishment and sufficient growth as approved by the Project Manager.

.2 Make good any exposed joints to ensure tight butt joints. No isolated pieces of

sod for crack filling will be accepted. Replace with a new bigger sod piece to complete the Work.

.3 Where in the opinion of the Project Manager, the Contractor has failed to provide the required maintenance to ensure root establishment and growth, the Contractor shall remove, replace and maintain all sod identified by the Project Manager at no cost to the City.

END OF SECTION

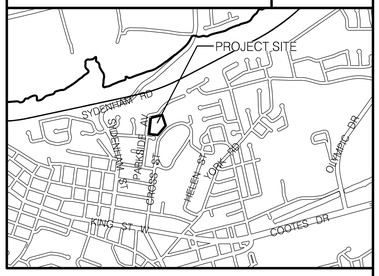
PARKSIDE CEMETERY DEVELOPMENT

DIMENSIONS SHOWN ON THIS PLAN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

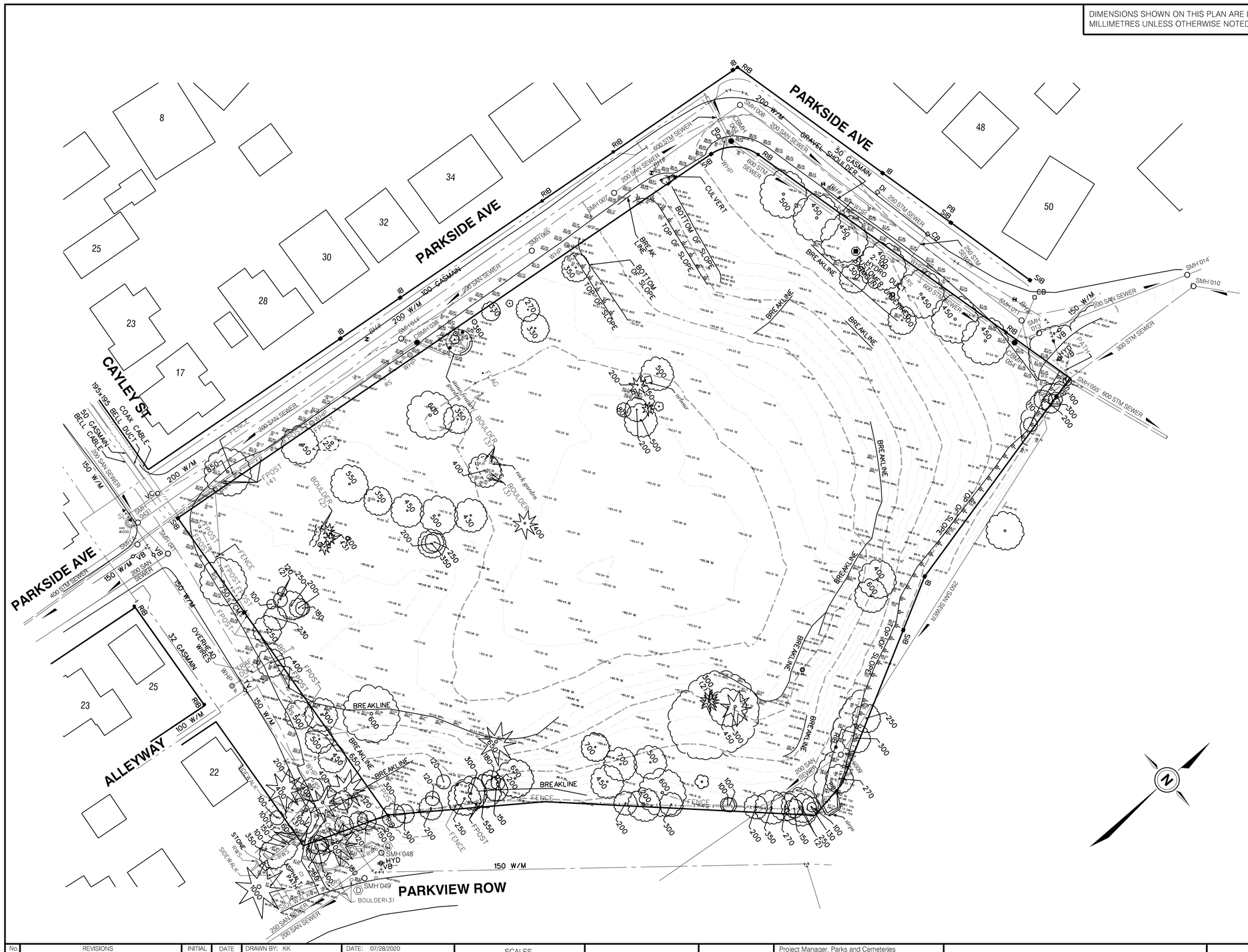
CONTRACT No. C13-04-21

DRAWING No. 13-04-21 (L1)

SHEET No. L1 OF Total 8



KEY MAP *(N.T.S.)*



NOTE:
CONTRACTOR TO REVIEW LAYOUT OF PROJECT ON SITE WITH CITY REPRESENTATIVE PRIOR TO CONSTRUCTION.

EXISTING SITE PLAN INFORMATION IS PROVIDED BY CITY OF HAMILTON GEOMATICS DEPT. ALL INFORMATION IS TO BE SITE VERIFIED.

C13-04-21

No.	REVISIONS	INITIAL	DATE

DRAWN BY: KK DATE: 07/28/2020

REFERENCE MATERIAL:
Road Plans :
Sewer Plans :
Water Plans :
Regional Surveyor :
Geodetic Bench Mark Index No.
Elevation=

SCALES
0 5m 10m 20m
1:400

Project Manager, Parks and Cemeteries
Jim Collins

Hamilton

City of Hamilton
Public Works Department

PARKSIDE CEMETERY DEVELOPMENT
Existing Site Plan

L1

$FILEL$

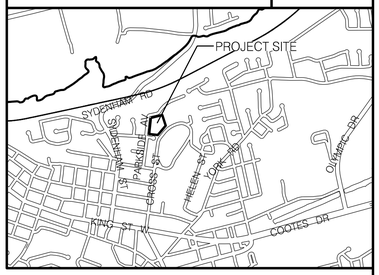
PARKSIDE CEMETERY DEVELOPMENT

DIMENSIONS SHOWN ON THIS PLAN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

CONTRACT No. C13-04-21

DRAWING No. 13-04-21 (L2)

SHEET No. L2 OF Total 8



KEY MAP *(N.T.S.)*

EXISTING TREES TO REMAIN

EXISTING FEATURES TO BE REMOVED

LIMIT OF CONSTRUCTION (CONSTRUCTION FENCE)

SILT FENCE (OPSD 219.130)

BH #1 *EXISTING BOREHOLE*

CB *CATCH BASIN WITH TEMPORARY SEDIMENT TRAP*

PARKSIDE AVE

CAYLEY ST

PARKSIDE AVE

ALLEYWAY

PARKSIDE AVE

PARKVIEW ROW

GRAVEL SHOULDER

REMOVE AND DISPOSE OFF-SITE EXISTING CULVERT AND ASSOCIATED CONNECTION TO CATCHBASIN / MANHOLE. PLUG AND GROUT CONNECTION SOLID.

SUPPLY AND INSTALL TEMPORARY CONSTRUCTION ACCESS MUD MAT - 50mm CLEAR STONE, MINIMUM 8.0m x 7.0m, 150mm DEEP.

REMOVE AND DISPOSE EXISTING CONCRETE PAVING AROUND STONE FEATURES COMPLETELY. CONTRACTOR TO ALSO REMOVE AND DISPOSE OFF-SITE OF EXISTING PLANTS WITHIN RAISED GARDEN FEATURE.

SUPPLY AND INSTALL CATCH BASIN SEDIMENT TRAPS ON ALL ADJACENT CATCH BASIN AND MANHOLES. SEE DETAILS.

REMOVE AND DISPOSE OFF-SITE EXISTING SHRUBS.

EXISTING FLAG POLE TO REMAIN.

REMOVE AND DISPOSE OFF-SITE EXISTING FENCE POSTS AND CHAIN AND FOOTINGS COMPLETELY.

REMOVE AND DISPOSE OFF-SITE EXISTING TREE & STUMP COMPLETELY.

EXISTING BOREHOLE (1 OF 3 BY OTHERS) TO REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION.

REMOVE AND DISPOSE OFF-SITE EXISTING BRUSH AND GRUBBING. CEDAR TREES TO REMAIN.

REMOVE AND DISPOSE OFF-SITE EXISTING ASPHALT FROM ROADWAY LEADING TO PATHWAY COMPLETELY. GRANULAR BASE TO REMAIN.

CHINESE ELM TREE TO REMAIN. ALL OTHER TREES AND SHRUBS/GRUBBING TO BE REMOVED AND DISPOSED OFF-SITE FROM THIS AREA.

REMOVE AND DISPOSE OFF-SITE EXISTING BRUSH AND GRUBBING.

REMOVE AND DISPOSE OFF-SITE EXISTING TREE STUMP AND EMBEDDED TIMBER WOOD COMPLETELY.

REMOVE AND DISPOSE OFF-SITE EXISTING TREE & STUMP COMPLETELY.

REMOVE AND DISPOSE OFF-SITE EXISTING TREE AND STUMPS COMPLETELY.

EXISTING BOREHOLE (2 OF 3 BY OTHERS) TO REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION.

REMOVE AND DISPOSE OFF-SITE EXISTING TREE AND STUMPS COMPLETELY.

REMOVE AND DISPOSE OFF-SITE EXISTING ARBOUR.

REMOVE AND DISPOSE OFF-SITE EXISTING MULBERRY AT GINKGO TREE. GINKGO TREE TO REMAIN.

REMOVE AND DISPOSE OFF-SITE EXISTING LARGE SPIREA AND MANITOBA MAPLE INCLUDING STUMPS.

EXISTING BOREHOLE (3 OF 3 BY OTHERS) TO REMAIN AND BE PROTECTED THROUGHOUT CONSTRUCTION.

CONNECT CONSTRUCTION FENCE TO EXISTING CHAIN LINK FENCE(S) WHERE SHOWN.

REMOVE AND DISPOSE OFF-SITE EXISTING ASPHALT PAVING AND GRANULAR BASE COMPLETELY.

REMOVE STEEL RAILING, LIFT EXISTING PRECAST CONCRETE STEPS AND RELAY WITH APPROPRIATE BASE AS REQUIRED TO CREATE CONSISTENT RISER HEIGHTS.

REMOVE AND DISPOSE OFF-SITE EXISTING ASPHALT AND GRANULAR BASE FROM PARK PATHWAY COMPLETELY.

BOULDER(3)

BOULDER(5)

BOULDER(4)

BOULDER(3)

BOULDER(3)

FENCE

FENCE

FENCE TO REMAIN

CB

CBMH

BM #1

BM #2

BM #3

TOP OF SLOPE

BOTTOM OF SLOPE

CULVERT

FLAG

PATH

SIDEWALK

STONE

ASPHALT PATH

BRICK PAVER WALKWAY TO REMAIN UNDISTURBED

17m

SL

C13-04-21

No.	REVISIONS	INITIAL	DATE

DRAWN BY: KK DATE: 07/28/2020

REFERENCE MATERIAL:
Road Plans :
Sewer Plans :
Water Plans :

Regional Surveyor :

Geodetic Bench Mark Index No.
Elevation=

SCALES

0 5m 10m 20m

1:400

Project Manager, Parks and Cemeteries

Jim Collins

City of Hamilton

Hamilton

Public Works Department

PARKSIDE CEMETERY DEVELOPMENT

Site Preparation and Removals Plan

L2

$FILEL$

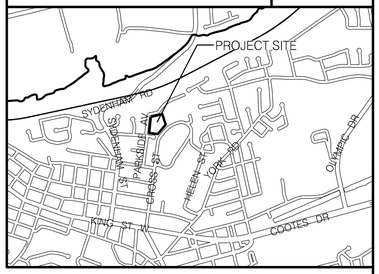
PARKSIDE CEMETERY DEVELOPMENT

DIMENSIONS SHOWN ON THIS PLAN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED

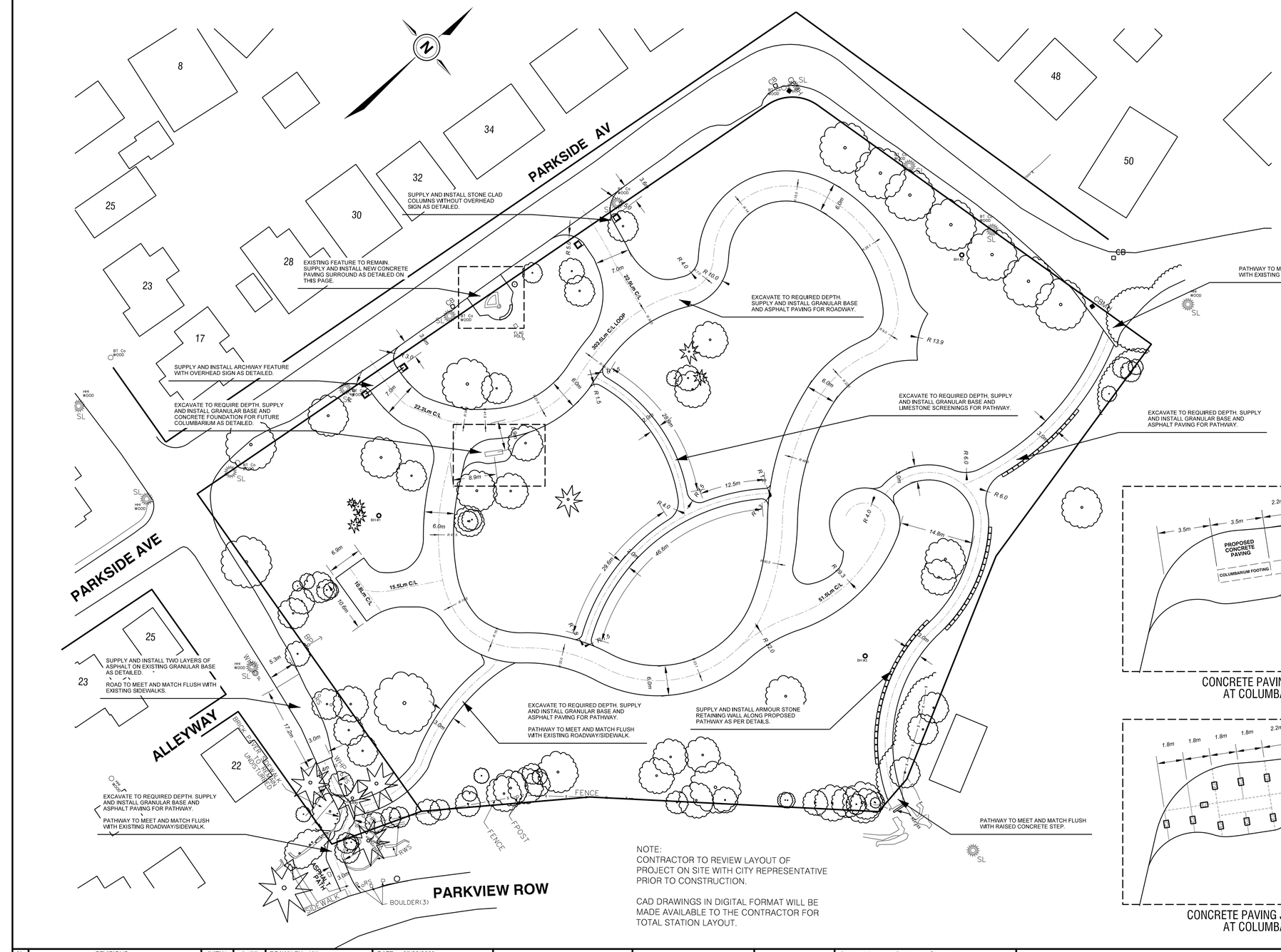
CONTRACT No. C13-04-21

DRAWING No. 13-04-21 (L3)

SHEET No. L3 OF Total 8



KEY MAP *(N.T.S.)*



NOTE:
CONTRACTOR TO REVIEW LAYOUT OF PROJECT ON SITE WITH CITY REPRESENTATIVE PRIOR TO CONSTRUCTION.

CAD DRAWINGS IN DIGITAL FORMAT WILL BE MADE AVAILABLE TO THE CONTRACTOR FOR TOTAL STATION LAYOUT.

EXISTING TREES TO REMAIN

PROPOSED ARMOUR STONE RETAINING / SEAT WALLS

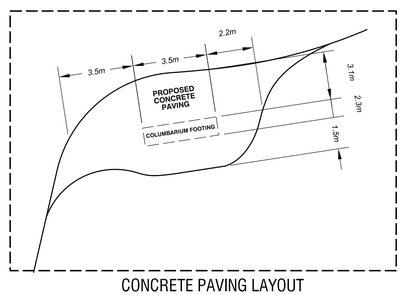
PROPOSED ROADWAY CENTRELINE

EXISTING BOREHOLE

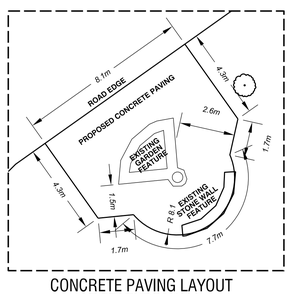
BH #1

EJ *PROPOSED CONCRETE EXPANSION JOINT*

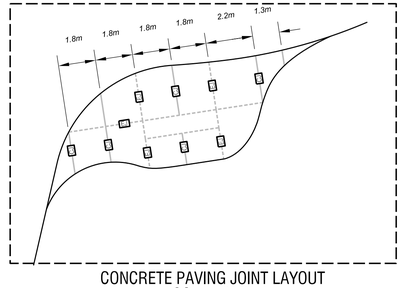
CJ *PROPOSED CONCRETE CONTROL JOINT*



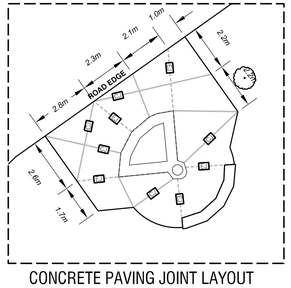
CONCRETE PAVING LAYOUT AT COLUMBARIUM



CONCRETE PAVING LAYOUT AT FEATURE WALL



CONCRETE PAVING JOINT LAYOUT AT COLUMBARIUM



CONCRETE PAVING JOINT LAYOUT AT FEATURE WALL

C13-04-21

No.	REVISIONS	INITIAL	DATE

DRAWN BY: KK DATE: 07/28/2020

REFERENCE MATERIAL:
Road Plans :
Sewer Plans :
Water Plans :
Regional Surveyor :
Geodetic Bench Mark Index No.
Elevation=

SCALES
0 5m 10m 20m
1:400

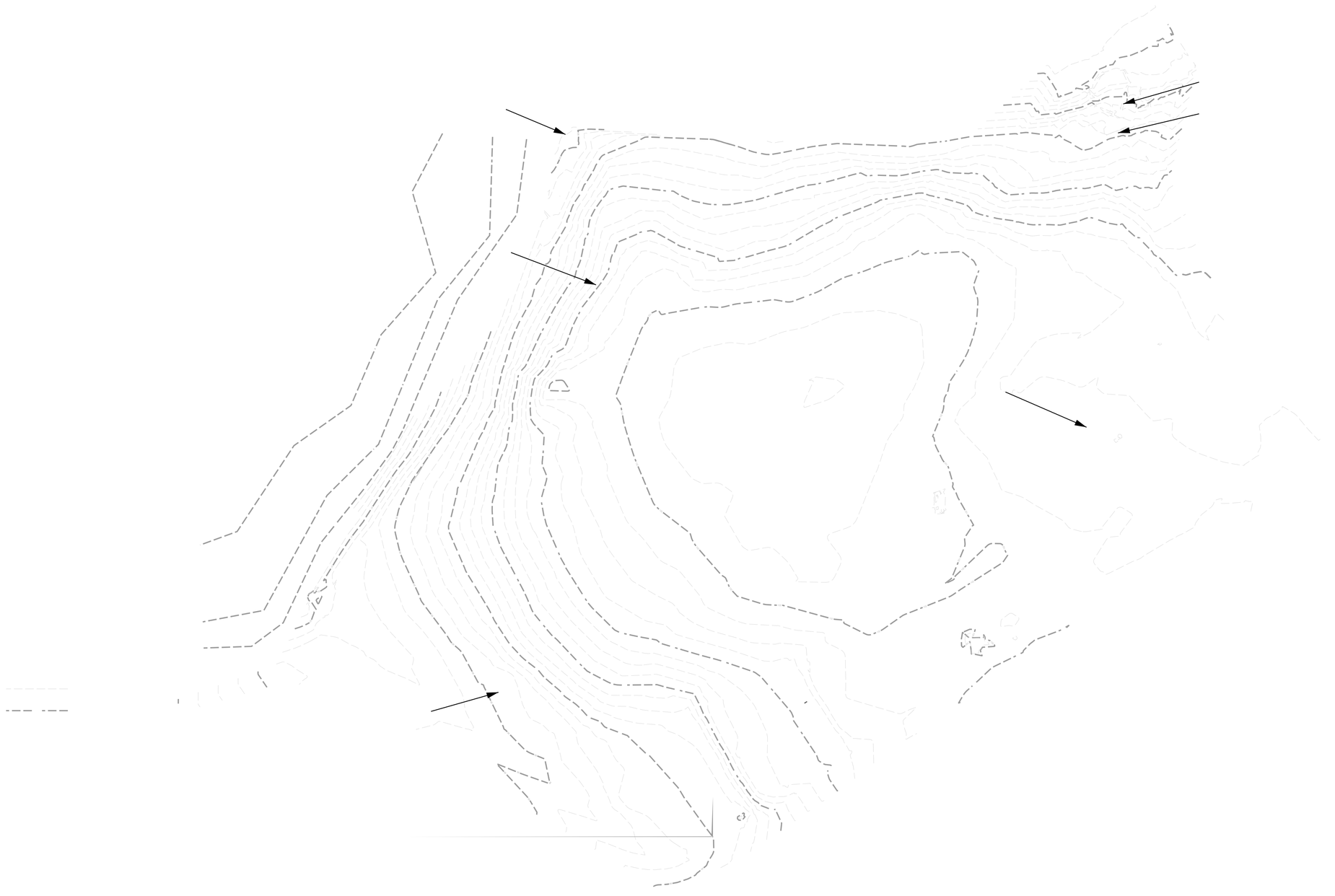
Project Manager, Parks and Cemeteries
Jim Collins

Hamilton

City of Hamilton
Public Works Department

PARKSIDE CEMETERY DEVELOPMENT
Proposed Site Plan
L3

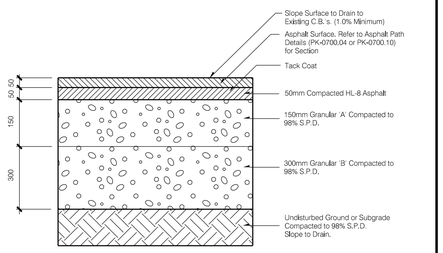
$FILEL$



PARKSIDE CEMETERY DEVELOPMENT

SHEET No.

L7 OF Total 8

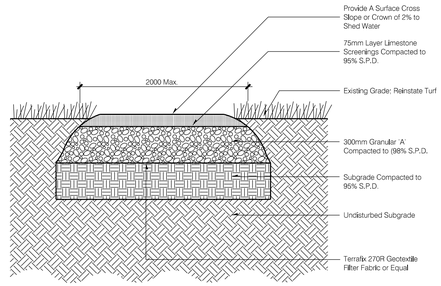


Hamilton PUBLIC WORKS

City of Hamilton
Public Works Department

ASPHALT PAVING - ROADWAYS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	July 2017	1	FORMERLY: OSD 0710.09	PK-0710.09



NOTES:

1. Restore all Damage to Existing Sod. Sod Laid at Trail Edge to be Placed 25mm Below the Tread on Level Ground or on The Downhill Side of a Cross Slope. Sod Laid on the Uphill Side of a Cross Slope to be Level With the Tread of The Walkway to Ensure Positive Drainage.
2. All Dimensions in Millimetres.
3. Refer to Landscape Plans for Path Width.

Hamilton PUBLIC WORKS

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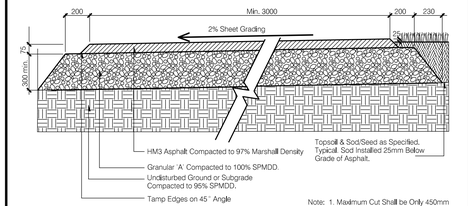
Public Works Department

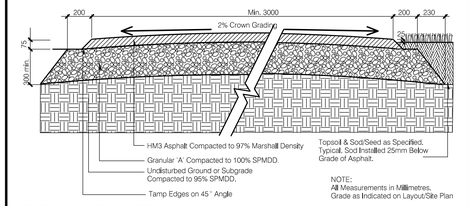
LIMESTONE SCREENING WALKWAY

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	June 2008	1	FORMERLY: OSD 0720.01	PK-0720.01



SECTION - SHEET DRAINAGE 1:20

Note: 1. Maximum Cut Shall be Only 450mm Beyond Each Side of Walkway.
2. Topsoil Shall be Blended to Meet Existing Grade, Transitional Slope Not to Exceed 5:1.



SECTION - CROWN DRAINAGE 1:20

NOTE:
All Measurements in Millimetres, Grade as Indicated on Layout/Site Plan

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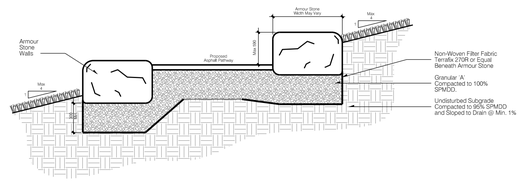
Public Works Department

ASPHALT WALKWAY STANDARD 'A'

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	July 2014	0	FORMERLY: N/A	PK-0700.10



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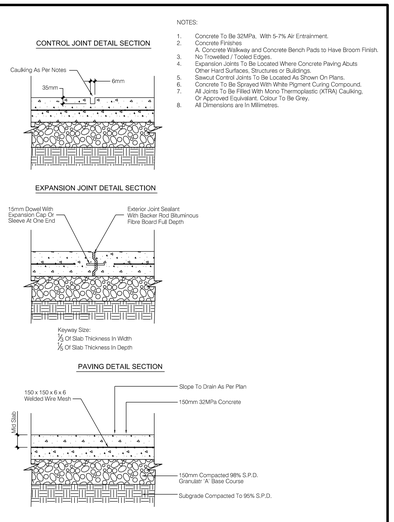
Public Works Department

ARMOUR STONE DETAIL

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	October 2020	1		



NOTES:

1. Concrete To Be 32MPa. With 5-7% Air Entrainment.
2. Concrete Finishes
   A. Concrete Walkway and Concrete Bench Pads to Have Broom Finish.
3. No Trowelled / Tooled Edges.
4. Expansion Joints To Be Located Where Concrete Paving Abuts Other Hard Surfaces, Structures or Buildings.
5. Sawcut Control Joints To Be Located As Shown On Plans.
6. Concrete To Be Sprayed With White Pigment Curing Compound.
7. All Joints To Be Filled With Mono Thermoplastic (XTRA) Caulking. Or Approved Equivalent. Colour To Be Grey.
8. All Dimensions are In Millimetres.

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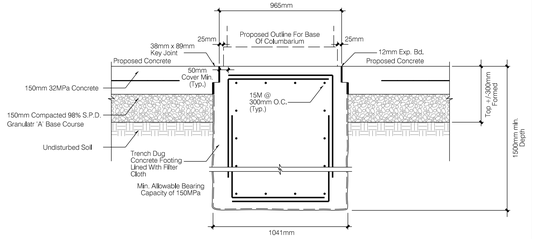
City of Hamilton
Public Works Department

CONCRETE PAVING

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	October 2020	1		

COLUMBARIUM FOUNDATION PLAN



SECTION A-A - COLUMBARIUM FOUNDATION SECTION

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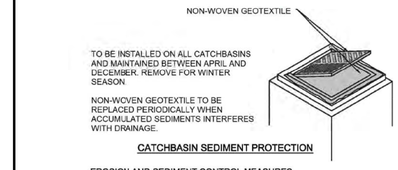
City of Hamilton
Public Works Department

CONCRETE COLUMBARIUM FOUNDATION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	October 2020	1		



TO BE INSTALLED ON ALL CATCHBASINS AND MAINTAINED BETWEEN APRIL AND DECEMBER. REMOVE FOR WINTER SEASON.

NON-WOVEN GEOTEXTILE TO BE REPLACED PERIODICALLY WHEN ACCUMULATED SEDIMENTS INTERFERES WITH DRAINAGE.

CATCHBASIN SEDIMENT PROTECTION

EROSION AND SEDIMENT CONTROL MEASURES

CONSTRUCT "MUD-MAT" AS INDICATED AND MAINTAIN UNTIL SITE IS STABILIZED. MUD TRACKED ONTO EXISTING ROADWAYS FROM THE SITE IS TO BE REMOVED

PREVENT EROSION OF MATERIAL STOCKPILES. DURING WORK STOPPAGES OR INCLEMENT WEATHER, PLUG ENDS OF OPEN SEWERS TO PREVENT DOWNSTREAM SEDIMENTATION. INSTALL CATCHBASIN SEDIMENT PROTECTION AS PER DETAIL, AND MAINTAIN UNTIL SODDING AND ASPHALT PAVING IS COMPLETED

Hamilton PUBLIC WORKS

City of Hamilton
Public Works Department

CATCH BASIN SEDIMENT CONTROL

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No		HAMILTON STD No
	October 2020	1		

C13-04-21

No.	REVISIONS	INITIAL	DATE

DRAWN BY: KK | DATE: 07/28/2020

REFERENCE MATERIAL:
Road Plans :
Sewer Plans :
Water Plans :
Regional Surveyor :
Geodetic Bench Mark Index No.
Elevation=

SCALES

N.T.S.

Project Manager, Parks and Cemeteries

Jim Collins

Hamilton

City of Hamilton

Public Works Department

PARKSIDE CEMETERY DEVELOPMENT

Details

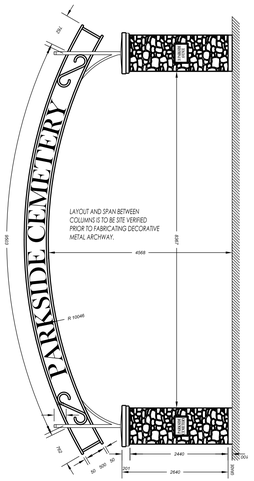
L7

$FILEL$

PARKSIDE CEMETERY DEVELOPMENT

SHEET No.

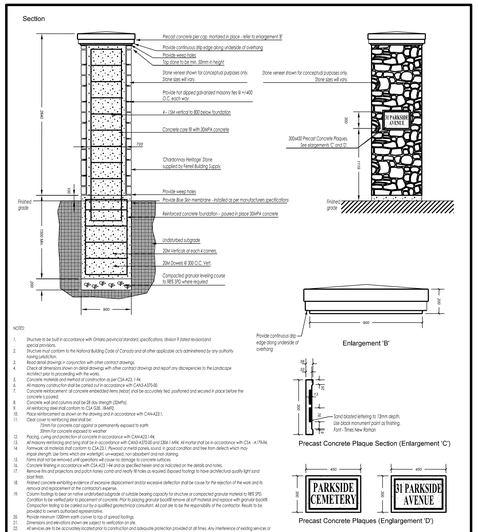
L8 OF Total 8



City of Hamilton
Public Works Department

ARCHWAY DESIGN

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			

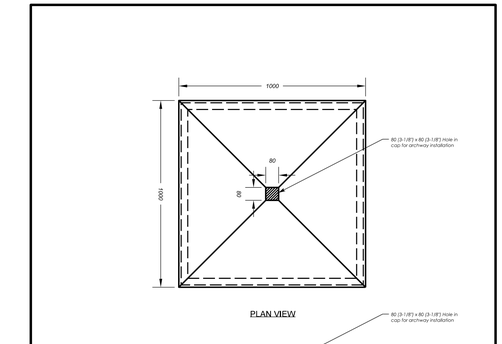


NOTES:
1. Structure to be built in accordance with Ontario private boat standard, specifications, division B (latest revision) special provisions.
2. Structure must conform to the National Building Code of Canada and all other applicable acts administered by any authority having jurisdiction.
3. Read detail drawings in conjunction with other contract drawings.
4. Check all dimensions shown on detail drawings with other contract drawings and report any discrepancies to the Landscape Architect prior to proceeding with the work.
5. Concrete material and method of construction as per CSA-A23.1/A-24.
6. All masonry construction shall be carried out in accordance with CAN/A-370-04.
7. Concrete reinforcement: all concrete embedded items (steps) shall be accurately tied, positioned and secured in place before the concrete is poured.
8. All concrete footings and columns shall be 25 Mpa strength (28MPa).
9. All reinforcing steel shall conform to CSA G30. 18M/E.
10. Place reinforcement as shown on the drawing and in accordance with CAN-A23.1.
11. Clear cover to reinforcing steel shall be:
    75mm For concrete cast against or permanently exposed to earth.
    50mm For concrete exposed to weather.
12. Placing, curing and protection of concrete in accordance with CAN-A23.1-94.
13. All masonry reinforcing and tying shall be in accordance with CAN-S-A370-80 and CSA-I. M94. All mortar shall be in accordance with CSA - A179-94.
14. Formwork: all materials shall conform to CSA-O.1. Plywood or metal panels, sound, in good condition and free from defects which may impair strength. Use forms which are watertight, un-warped, non absorbent and non staining.
15. Forms shall not be removed until operations will cause no damage to concrete surface.
16. Concrete finishing in accordance with CSA-A23.1-94 and as specified herein and as indicated on the details and notes.
17. Remove fins and projections and patch honey combs and voids 19 mm as required. Exposed footings to have architectural quality light sand blast finish.
18. Finished concrete exhibiting evidence of excessive displacement and/or excessive deflection must be cause for the rejection of the work and its removal and replacement at the contractors expense.
19. Column footings to bear on native undisturbed subgrade of suitable bearing capacity for structure or compacted granular material to 98% SPD.
20. Where soft, spongy or otherwise unsuitable material is encountered, excavate to existing granular backfill remove all soft material and replace with granular backfill. Compaction testing to be carried out by a qualified geotechnical consultant. All cost are to be the responsibility of the contractor. Results to be provided to owners authorized representative.
21. Provide minimum 1200mm earth cover to top of precast footings.
22. Dimensions and elevations shown are subject to verification on site.
23. All utilities shall be located by contractor prior to excavation. Adequate protection provided at all times. Any interference of existing services or utilities with proposed structure or construction operations to be reported to the project engineer and landscape architect.
24. Report all discrepancies to the Landscape Architect prior to proceeding with the work.

City of Hamilton
Public Works Department

PARKSIDE CEMETERY COLUMN DETAILS

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			

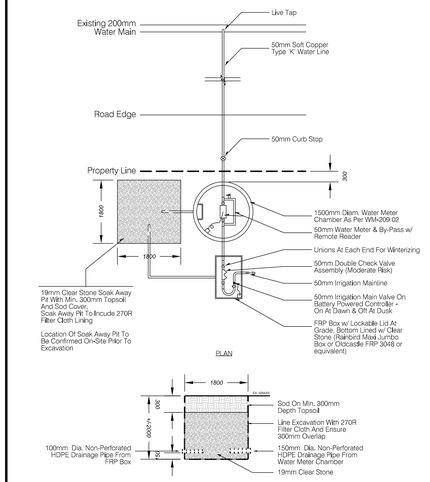


City of Hamilton
Public Works Department

PRECAST COLUMN CAP DETAIL

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			

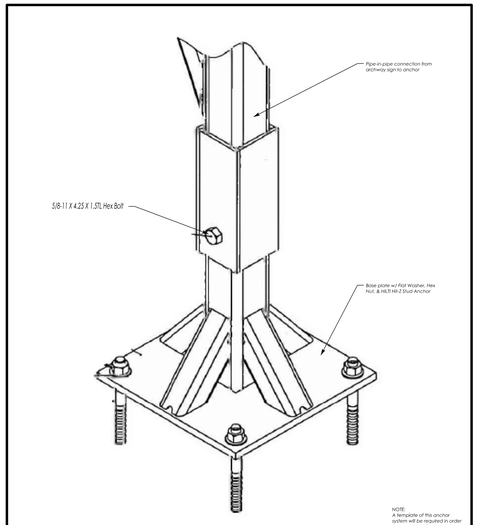
Detail Shown For Schematic Purposes Only



City of Hamilton
Public Works Department

IRRIGATION SERVICE DETAIL

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			



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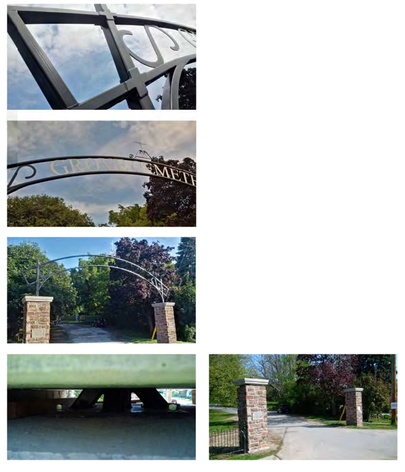
ARCHWAY SIGN ANCHOR

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			



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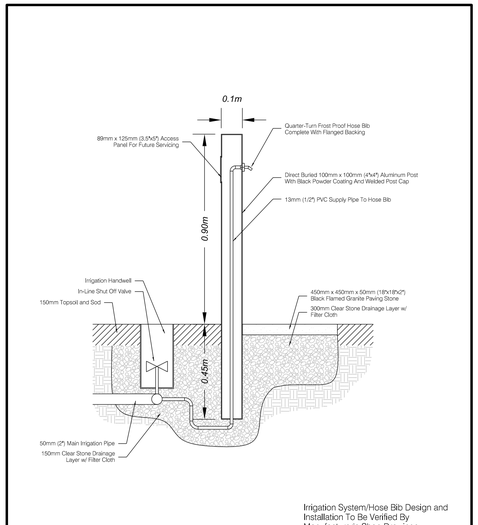
Public Works Department

PRECEDENT IMAGES

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			



150mm TO SOAK AWAY PIT

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IRRIGATION / HOSE BIB CONNECTION

DIMENSIONS SHOWN ARE IN MILLIMETRES UNLESS OTHERWISE NOTED (N.T.S.)	DATE	REV No	FORMERLY:	HAMILTON STD No
	July 2020			

C13-04-21

No.	REVISIONS	INITIAL	DATE

DRAWN BY: KK | DATE: 07/28/2020

REFERENCE MATERIAL:
Road Plans :
Sewer Plans :
Water Plans :
Regional Surveyor :
Geodetic Bench Mark Index No.
Elevation=

SCALES

N.T.S.

Project Manager, Parks and Cemeteries

Jim Collins

Hamilton

City of Hamilton

Public Works Department

PARKSIDE CEMETERY DEVELOPMENT

Details

L8

$FILEL$