

PART E

SPECIFICATIONS

PART E - SPECIFICATIONS

GENERAL

E1. APPLICABLE SPECIFICATIONS, STANDARD DETAILS AND DRAWINGS

- E1.1 *The City of Winnipeg Standard Construction Specifications* in its entirety, whether or not specifically listed on Form B: Prices, shall apply to the Work.
- E1.1.16 *The City of Winnipeg Standard Construction Specifications* is available in Adobe Acrobat (.pdf) format on the Information Connection page at The City of Winnipeg, Corporate Finance, Materials Management Division internet site at <http://www.winnipeg.ca/matmgt>.
- E1.1.17 The version in effect three (3) Business Days before the Submission Deadline shall apply.
- E1.1.18 Further to GC:2.4(d), Specifications included in the Bid Opportunity shall govern over *The City of Winnipeg Standard Construction Specifications*.
- E1.2 The following Drawings are applicable to the Work:

<u>Drawing No.</u>	<u>Drawing</u>
L-1	Overall Site Plan
L-2	Asphalt Path / Soccer Pitch
L-3	Entry Road / Erosion Control Berm
L-4	Harbour View
L-5	Site Signage
L-6	Site Map Graphics

E2. SOILS INVESTIGATION REPORT

- E2.1 Further to GC:3.1, no Soils Investigation has been done. Should conditions warrant, the Contractor is responsible for conducting and supplying Soils Investigation Report.

GENERAL REQUIREMENTS

E3. OFFICE FACILITIES

- E3.1 The Contractor shall not be required to supply office facilities for this project.

E4. LOCATION OF WORK

Kilcona Park – Harbour View Recreation Complex, North East corner of Springfield Road and Lagimodiere Blvd.

E5. PROTECTION OF THE SURVEY INFRASTRUCTURE

- E5.1 Notwithstanding CW 1130-R1 3.14 'Protection of Survey Infrastructure' of the Standard Construction Specifications, current legislation, The Surveys Act, places the onus on those undertaking construction to protect the Survey Infrastructure from damage as a result of their activity.

- E5.2 Further to GC:6.28(g), at least 72 hours prior to the commencement of the On-Site Work the Contractor shall contact the City of Winnipeg, Geomatics Services Branch at 986-4826 (8:00 a.m. to 4:00 pm Monday to Friday excluding holidays) to obtain clearance. Geomatics Services will locate and mark all known outline survey monuments and geodetic control monuments and confirm the physical condition of those monuments upon completion of construction, at no cost to the Contractor.
- E5.3 Where a survey post, bar, or control monument lies in the line of proposed work and must be disturbed, the Contractor shall provide the Contract Administrator with 48 hours notice to permit referencing for future replacement, at no cost to the Contractor. Failure to provide the specified notice shall result in the Contractor paying for all costs associated with replacing or relocating the disturbed outline survey monuments and geodetic control monuments.
- E5.4 Outline survey monuments and geodetic control monuments at or adjacent to the Site, not in line of the proposed construction that are damaged or disturbed by the Contractor shall be replaced or relocated by the City or its agent and all associated costs shall be paid for by the Contractor. An approximate estimate of the costs involved to restore a legal survey monument is \$1000 per bar and \$3000 per control monument. Contractors must ensure their landscaping and other subcontractors are aware of this clearance procedure and the potential restoration costs.
- E5.5 Where possible, amounts owed to the City in accordance with the above will be deducted from any payments to be made by the City to the Contractor.

E6. PERMITS, NOTICES, LICENSES, CERTIFICATES, LAWS AND RULES

- E6.1 Further to GC:6.12 the Contractor shall give all necessary notices, obtain all necessary permits, and pay all fees in order that the work may be carried out. The Contractor shall submit all plans required by any inspection authority and obtain approval of same before proceeding with the Work, and pay any cost attached to the inspection and approval of such plans.
- E6.2 All notices, consents, approvals, statements, authorizations, documents, or other communications to the City shall be submitted to the Contract Administrator.
- E6.3 The Contractor shall comply with all laws, ordinances, rules and regulations that would relate to the work.
- E6.4 All work shall be performed in a manner compliant with the Manitoba Workplace Health and Safety act.
- E6.5 All work shall be performed in a manner compliant with the Manitoba Workplace Health and Safety Fall Protection Guidelines
- E6.6 The Contractor and Subcontractors must be fully aware of all Work involving hazardous materials. All Work must be performed in compliance with the Manitoba Department of Labour Workplace Safety and Health Guidelines and all other applicable codes. The Contractor is responsible for the immediate notification to the Contract Administrator or his/her encountering of suspected hazardous material during the course of Work.

E7. DAMAGE TO EXISTING STRUCTURES AND PROPERTY

- E7.1 Further to GC:17, all necessary precautions shall be exercised by the Contractor so as not to remove, disturb, or damage any existing trees, shrub, sod, pavements, streets, roads, boulevards, poles, hydrants, water pipes, gas pipes, electrical wires, cables, conduits, sewers, or other existing facilities and equipment at the Site of Work. For all damage incurred thereto in the performance of the Work, the Contractor shall upon instructions from and to the satisfaction of the Contract Administrator and the owners thereof, either replace and repair such damage,

whichever may be deemed necessary in the opinion of, and acceptable to, the Contract Administrator and the owners thereof. The cost of which shall be borne entirely by the Contractor.

E7.2 The Contractor shall also indemnify and save harmless the City and the Contract Administrator, from all claims made directly or indirectly against it in respect to such damage.

E7.3 The Contractor's operations shall be limited to the minimum area necessary for undertaking the Work and he shall be responsible for all damage resulting from his work on private property. The Contractor shall take such measures as are necessary to ensure safe and convenient pedestrian ingress and egress is maintained to private properties while he is working near them.

E7.4 Any damage caused by the negligence of the Contractor or his Sub-contractors to the adjacent works or properties, shall be promptly repaired by him at his own expense, to the satisfaction of the Contract Administrator.

E8. TEMPORARY UTILITIES

E8.1 Further to GC:6.12, the Contractor shall make his own arrangements in connection with the temporary use of lighting, power, gas, sewer, water or other utilities, and pay all costs in connection therewith.

E8.2 All necessary permits, fees, and other like expenses as well as the cost of temporary connections to existing facilities shall be arranged and paid for by the Contractor.

E9. LAYOUT OF WORK

E9.1 The Contractor will set control lines and bench marks by means of stakes, buoys or marks and the Contractor shall make the completed works conform to the lines and marks thus indicated. The Contractor shall furnish all other lines and levels required. The Contractor shall be responsible for the careful preservation of all stakes and marks so set whether relating to his own or to the work of others. Care must be taken that the Contract Administrator be notified immediately of the disturbance of any such stakes or marks. The cost of correcting any errors arising out of the neglect of the Contractor or his agent or his employees, to so notify the Contract Administrator, shall be borne entirely by the Contractor, as well as the cost of replacing any disturbed stakes or marks.

E9.2 All layout work shall be inspected and approved by the Contract Administrator prior to construction.

E9.3 Before commencing work the Contractor shall satisfy himself as to the meaning and correctness of all stakes and marks and no claims shall be entertained by the City of Winnipeg or the Contract Administrator on account of any alleged inaccuracies. If any error is suspected in the plans, specifications, or the directions of the Contract Administrator, Work shall be discontinued until the errors are rectified, but no claims shall be made on account of any delay occasioned thereby.

E10. SITE CLEANUP AND RESTORATION

E10.1 All pathways, streets, approaches, driveways, and properties near the Work Site shall be kept clean at all times by the Contractor.

E10.2 Upon completion of the Work the Contractor shall immediately remove all excess materials and debris from the work site.

E10.3 Total performance of the Work shall not be attained until the Contractor has cleaned up the Site and has removed all plant, tools, equipment, waste, debris, and surplus earth, to the satisfaction of the Contract Administrator. Unless otherwise specified, the Contractor shall restore all areas of the Site which have been disturbed by the Contractor's operations to as good or better than the original condition to the satisfaction of the Contract Administrator. The Contractor shall pay all costs associated with this work.

E11. SAFETY

E11.1 The Contractor shall comply with the following:

- (a) The City of Winnipeg's Safety in the Workplace Policy for Alcohol or any Mood or Mind Altering Drug in the Workplace.
- (b) The City of Winnipeg Safety Manual
- (c) The Public Works Department's Safety Regulations
- (d) The Province of Manitoba Workplace, Safety and Health Act.

E11.2 The Contract Administrator and the City of Winnipeg, Public Works Department's Safety Officer has the authority to enforce all the above listed safety and/or health regulations.

E11.3 Notwithstanding E11.2 the Contractor shall be solely responsible for construction and public safety at the Site and for securing the Site at all times to prevent public access.

E11.4 The Contractor shall, at his own expense, do whatever is necessary to ensure that when work is stopped, and the Contractor leaves the Site for whatever reason, the Site and Work is made safe, including but not limited to:

- (a) The removal and/or safe storage of all construction equipment and materials.
- (b) The equipment installed and/or in the process of installation be completed or secured to ensure that no public hazards exist.
- (c) That all open excavations be filled; and
- (d) That all construction debris and surplus excavation material be removed from the Site.

WORK

E12. DEMOLITION AND REMOVALS

E12.1 This section shall cover the removal of existing gravel roadway where it is called for on the drawings.

E12.2 This specification is supplemental to CW 3170-R3.

E12.3 To the extent and limits shown on the drawings the existing gravel roadway is to be excavated to a depth sufficient to remove the existing granular material in its entirety. The Contractor is to lay out the area of the roadway to be removed from site and the Contract Administrator is to approve the location and the extent of this work prior to work beginning.

E12.4 Excavated granular material is to be stockpiled in an area to be designated by the Contract Administrator.

E12.5 Measurement and payment for this section shall be on a square meter basis for the actual area of the existing gravel roadway removed. There will be no measurement or additional payment for removal of any material beyond that approved by the Contract Administrator prior to the commencement of excavation.

E13. ASPHALT PATHS

- E13.1 This specification covers the supply and installation of asphalt path including all excavation, compaction, geotextile, sub-base and base construction, asphaltic paving, and repair of existing sod to ensure a smooth transition to the pathway.
- E13.2 This specification is supplemental to CW 3110-R7 and CW 3170-R3 and CW 3410-R5. Materials and installation are to conform to these standard specifications.
- E13.3 Excavated material is to be disposed of on site as directed by Contract Administrator.
- E13.4 Sub-base, base materials and depths are as noted on drawing.
- E13.5 Asphaltic paving is to be Type 1A. Depth, alignment, grade is as noted on the drawing. Asphalt shall be placed in one lift.
- E13.6 Except as specifically noted on the drawing pathways are to be constructed so as to function with existing drainage patterns and are to have a minimum cross slope of 1%.
- E13.7 Sub-base and base courses are to extend past asphalt as shown on the drawing.
- E13.8 Asphalt is to meet existing asphalt in a neat and precise manner.
- E13.9 Measurement and Payment will be at the contract unit price per square meter for 'Asphalt Pathway'. Measurement shall be of the actual area covered by Asphalt. Price shall be payment in full for supplying materials and for performing all operations listed below:
- (a) Excavate in-situ material to accommodate the pavement structure including base and subbase. Disposal of excess material.
 - (b) Supply and installation of Geotextile.
 - (c) Supply and placement of Crushed limestone Subbase course.
 - (d) Supply and placement of Crushed limestone base course.
 - (e) Supply and placement of Asphaltic Concrete .
 - (f) Repair of grass (tie-in) at edge of newly constructed path.

E14. GRAVEL ROAD EXTENSION

- E14.1 This specification covers the supply and installation of Gravel roadway including all excavation, compaction, geotextile, sub-base and base construction as well as gravel surfacing, and repair of existing sod to ensure a smooth transition to the roadway.
- E14.2 This specification is supplemental to CW 3110-R7 and CW 31170-R3. Materials and installation are to conform to these standard specifications.
- E14.3 Sub-base, base materials and depths are as noted on drawing.
- E14.4 Except as specifically noted on the drawing roadway is to be constructed so as to function with existing drainage patterns and is to have a minimum cross slope of 2% and a maximum cross slope of 5%.
- E14.5 Roadway is to meet existing gravel road in a neat and precise manner.
- E14.6 Measurement and Payment will be at the contract unit price per square meter for 'Gravel Road'. Measurement shall be of the actual area covered by gravel. Price shall be payment in full for supplying materials and for performing all operations listed below:

- (a) Excavate in-situ material to accommodate the pavement structure including base and subbase. Disposal of excess material.
- (b) Supply and installation of Geotextile.
- (c) Supply and placement of Crushed limestone base course.
- (d) Supply and placement of gravel surfacing.
- (e) Repair of grass (tie-in) at edge of newly constructed roadway.

E15. REGRADING AND RESODDING

- E15.1 This specification covers the excavation and disposal of unsuitable or excess material, the supply and installation of topsoil and sod, the topdressing and seeding of seem, edges and areas of minor site restoration.
- E15.2 This specification is supplemental to CW 3170-R3, CW 3540-R2, and CW 3510-R8.
- E15.3 Bidders are to note that the sodding repair in the Mini-Golf area and on the Soccer field is not to commence until after July 4, 2005.
- E15.4 Areas to be regraded and resodded are to be laid out on site and approved by Contract Administrator before commencing regrading work. Work outside the limits approved by the Contract Administrator will not be measured and will not be paid for under this section but considered incidental to the work. Incidental site restoration shall conform to the same specifications.
- E15.5 Prior to excavation, the perimeter of the areas being sodded are to be cut with a sod cutter in straight lines.
- E15.6 Where new sod meets existing turf the transition shall be a uniform even surface that is consistent with existing grades. Such joints are to be topdressed and seeded at the discretion of the Contract Administrator. There shall be no additional measurement or payment for topdressing and seeding.
- E15.7 Excavate in-situ material and/or supply additional sub-base material to accommodate the topsoil and sod in a manner conforming to the drainage pattern described in the drawings. Where no new drainage pattern is described in the drawings the excavation and/or installation of fill shall be consistent with existing drainage patterns. In no case shall grading operations impede site drainage. Dispose of excess material as directed by Contract Administrator.
- E15.8 Topsoil and sod are to be supplied and installed as per CW 3510-R8 and CW 3540-R3.
- E15.9 Measurement and Payment will be at the contract unit price per square meter for 'Regrading and Resodding'. Measurement shall be of the actual area resodded. Price shall be payment in full for supplying materials and for performing all operations listed below:
- (a) Excavate in-situ material and/or supply additional sub-base material.
 - (b) Supply and installation of topsoil.
 - (c) Supply and placement of sod.
 - (d) maintenance of sod.

E16. CRUSHER FINES PAVING

- E16.1 This specification covers the supply and installation of Crusher fines paving including all excavation, compaction, geotextile, sub-base and base construction as well as gravel surfacing, and repair of existing sod to ensure a smooth transition to the roadway. Other items necessary

to complete this portion of the work and not noted elsewhere are considered incidental to this work.

- E16.2 This specification is supplemental to CW 3110-R7 and CW 3170-R3. Materials and installation are to conform to these standard specifications.
- E16.3 Sub-base, base materials and depths are as noted on drawing.
- E16.4 Except as specifically noted on the drawing areas of crusher fines paving are to be constructed so as to function with existing drainage patterns and are to have a minimum cross slope of 2%.
- E16.5 Crusher fines paving is to meet existing landscaping, concrete paving and crusher fines paving in a neat and precise manner.
- E16.6 Measurement and Payment will be at the contract unit price per square meter for 'Crusher Fines Paving'. Measurement shall be of the actual area covered by Crusher fines. Price shall be payment in full for supplying materials and for performing all operations listed below:
- (a) Excavate in-situ material to accommodate the pavement structure including base and subbase. Disposal of excess material.
 - (b) Supply and installation of Geotextile.
 - (c) Supply and placement of Crushed limestone base course.
 - (d) Supply and placement of Crushed surfacing.
 - (e) Repair of grass (tie-in) at edge of newly constructed paving.

E17. PRECAST CONCRETE STEPPING STONES

- E17.1 This specification covers the supply and installation of precast concrete paving slabs.
- E17.2 Precast paver is to be 400 mm x 400 mm Pebblestone Slab as manufactured by Barkman Concrete, Winnipeg, Manitoba.
- E17.3 Base and sub-base are to be as per drawing
- E17.4 Where pavers are to be located in areas of existing sod, sod and topsoil are to be removed sufficient to allow for 3 cm minimum depth compacted base and 15 cm compacted sub-base. Finished elevation of the paver is to be not greater than 2 cm and not less than .5 cm above existing sod.
- E17.5 Measurement and payment shall be per each as per the contract unit price.

E18. POST BOLLARDS, POST AND CHAIN FENCING

- E18.1 This specification shall cover the supply and installation of Bollard fencing as well as Post and Chain fencing as described in the drawings.
- E18.2 Wood bollards are to be round wood posts as specified on the drawing. Bollards are to be installed by direct burial method at 1.8 m. O.C.. Bollards are to be plumb and in a straight line with each other. Tops of bollards are to follow the contour of the ground except for minor undulations. All cuts are to be treated with end cut preservative.
- E18.3 Metal chain is to be 6mm Galvanized and secured to each post with two 90 mm galvanized nails as per detail in drawings. 'Sag' in chain between sections is to be maximum 125 mm.
- E18.4 Measurement and payment for Bollard fencing will be per bollard at the contract unit price per bollard.

E18.5 Measurement and payment for Post and Chain Fencing will be per linear meter at the contract unit price per linear meter. Measurement for each discrete length of new post and chain fence, will be from the first new bollard to either the first existing bollard or, should the post and chain fence not tie into an existing post and chain fence, to the last new bollard of said length.

E19. TENNIS COURT WINDSCREEN

E19.1 This specification shall cover the supply and installation of the Tennis Court Windscreen.

E19.2 The scope of work includes removal and disposal of the existing windscreen including all fasteners, supply and installation of a new windscreen for locations noted on the drawings including layout/measurement, all fasteners and connectors, and any other items which may be incidental to installing a fully functional windscreen on the existing chain link tennis court fence

E19.3 The windscreen system shall be an open mesh 100% high ultraviolet resistant polypropylene having a weight of 185-204 gm./sq.m. (5.5 to 6.0 oz./sq.yd.), a tensile strength of warp 135 kg. (299 lbs.) weft 92.5 kg. (204 lbs.) And a windbreak of between 75-80%. Hems are to be 3.8 cm wide , double sewn and reinforced. Grommits are to be solid brass #2 or #3 and spaced 45-50 cm o.c. around the perimeter. Colour is to be dark green or black.

E19.4 Acceptable products include Douglas Poly Pro + and Covermaster open polypropylene or approved equal.

E19.5 Windscreen height is to be 2.7 m (9'). No single panel is to be greater than 18.3 m (60') in length.

E19.6 Contractor to warrantee both the materials and workmanship for a minimum of 12 months following installation.

E19.7 Contractor is to measure the existing fence and order custom panels to fit.

E19.8 Center of windscreen is to be secured to fence.

E19.9 Air vents with reinforced edges of a type recommended for polypropylene are to be placed minimum 3 m o.c. (10')

E19.10 Windscreen is to be attached to fence with tie wrap (min 22.5 kg (50 lb) break strength).

E19.11 Center of windscreen is to be attached to fence with black braided lacing poly rope. Minimum 250 kg. (550 lb) break strength.

E19.12 Windscreen is to be installed in accordance to manufacturers specification and according to standard good practice.

E19.13 Windscreen will be measured on a linear Meter basis for windscreen actually installed on the site and paid for at the contract unit price.

E20. TENNIS COURT FENCE EXTENSION

E20.1 This specification shall cover the extension of the bottom of the tennis court fence.

E20.2 Fence extension shall be understood to include the supply and installation of the new mesh, attaching the new mesh to the existing mesh, any trimming, tie back etc, to ensure a good fit with the existing asphalt and to mitigate any possibility of injury due to sharp edges.

E20.3 The purpose of the extension is to prevent the passage of tennis balls from passing under the existing fence.

- E20.4 The fence shall be extended by attaching a skirt of 30 cm wide 25mmx25mm square 10 guage galvanized welded wire mesh to the bottom of the fence.
- E20.5 Mesh shall be attached to the existing chain link fabric using galvanized hog rings 45 cm o.c. It shall be attached both at the top of the new mesh and at the bottom of the existing mesh.
- E20.6 The new mesh shall be installed so that the distance between the asphalt surface is not greater than 25 mm or less than 10 mm.
- E20.7 Measurement and payment shall be per linear meter of mesh installed and paid for at the contract unit rate.

E21. VOLLEY BALL POST REPLACEMENT

- E21.1 This specification shall cover the replacement of the Volleyball posts including removal of the existing posts, supply and installation of new posts, supply of new nets as well as all other items necessary and incidental to realizing a working volleyball net system.
- E21.2 Volleyball posts are to be Douglas Sports VBS-3SQ c.w. Ground Sleeves and net. Finish is to be Black.
- E21.3 Posts and ground sleeves are to be installed as per manufacturers recommendations. Ground sleeves are to be placed in concrete as per Manufacturers recommendation for Sand Volleyball courts.
- E21.4 Measurement will be per set with a set understood to mean two Volleyball posts, two ground sleeves placed in concrete footing, one volleyball net complete with all incidental items necessary to have a fully functioning volleyball net. Payment will be per set at the contract unit price.

E22. RELOCATION OF EXISTING FOUNTAIN

- E22.1 This specification shall cover the relocation of the existing fountain in the mini-golf facility at Harbourview Recreation Complex.
- E22.2 The scope of work is understood to include the dismantling of the existing fountain, disconnecting the fountain from the existing supply line, extending the existing supply line to the new location, reconnecting the existing fountain in the new location, and testing the system to ensure proper functioning.
- E22.3 The extension supply line is to match the existing supply line. All connectors to be stainless steel. The method of connection is to follow standard good practice.
- E22.4 The fountain is to be mounted in its new location in the same manner that it is mounted in the current location. The fabrication and installation of the mount is considered incidental to this item of work.
- E22.5 Measurement and payment for the relocation of the existing fountain is to be lump sum at the contract unit price.

E23. EROSION CONTROL BERM

- E23.1 This specification shall cover the supply and installation of the Erosion control berm. It shall include removal of existing grass from the area of the berm as well as supply and installation of new fill material. The installation of topsoil and sod on the erosion control berm is be included in section E9. Regrading and Resodding.

- E23.2 This specification is supplemental to CW 3170-R3.
- E23.3 Berm is to be laid out by the Contractor. Construction is not to commence until the location and extent of the berm is approved by Contract Administrator.
- E23.4 Cross sections in the drawings showing the berm are schematic only.
- E23.5 Contractor is to take appropriate measures to ensure that erosion of the clay landfill cap during the construction operation is minimized.
- E23.6 Contractor is to schedule work so that the period of time from removal of the existing grass to the installation of sod is as short as possible but in any case not longer than 6 working days.
- E23.7 Measurement and payment for this section of work shall be on a square meter basis of the area of the berm. Work including restoration work falling outside of the area approved by the Contract Administrator shall be considered incidental to this work and not measured or paid for by the City.

E24. GRAVEL SURFACING

- E24.1 This specification covers the supply and installation of new gravel surfacing on the existing gravel roadway. It includes smoothing the existing roadway, adding new gravel and compacting the new gravel.
- E24.2 This specification is supplemental to CW 3150-R4. Materials and installation are to conform to this standard specification.
- E24.3 Depth of new material shall conform to the drawings.
- E24.4 Depth of new material is to be tapered so as to ensure that it meets existing gravel road in a smooth manner.
- E24.5 Measurement and Payment will be at the contract unit price per square meter for 'Gravel Surfacing. Measurement shall be of the actual area covered by gravel. Price shall be payment in full for supplying materials and for performing all operations listed below:
- (a) Smoothing and scarifying existing roadbed.
 - (b) Supply and installation of gravel surfacing.

E25. FARM GATE

- E25.1 This specification covers the supply and installation of a farm gate including both end posts, rotating arm, and concrete pile.
- E25.2 The farm gate shall be a City of Winnipeg Farm gate as manufactured by the City of Winnipeg, Central Manufacturing/Repair Facility, 215 Tecumseh Street. (Bill Dowbyhuz 986-5505). Finish to be black.
- E25.3 Farm Gate shall be installed as per the drawings and City of Winnipeg Standard City Detail # 124.
- E25.4 Measurement and payment shall be lump sum for complete installed farm gate c.w. all incidental items of material and labour to ensure that fully operational farm gate working to the satisfaction of the Contract Administrator.

E26. WEATHERPROOF BULLETIN BOARD

- E26.1 This specification covers the supply and installation of a weatherproof bulletin board including mounting posts.
- E26.2 The bulletin board shall be Claridge Contemporary Bulletin Board Cabinet complete with locking weatherproof door and vinyl back panel or approved equal. Size shall be 90 cm x 90 cm.
- E26.3 The bulletin board shall be mounted to 2 pressure treated posts as per manufacturers specification. The posts shall be installed in the ground as shown in the drawings.
- E26.4 Payment for this item shall be lump sum and shall include all items necessary and incidental for the complete supply and installation of the bulletin board.

E27. SITE MAP

- E27.1 This specification covers the supply and installation of a weather proof, graffiti resistant site map as per the drawings.
- E27.2 The sign shall be digitally colour printed to a solid Phenolic or Intecel PVC panel with a UV coating. Panel to be 1.2m (4') x 2.4m (8') with 19mm (3/4") thickness.
- E27.3 Artwork will be supplied to the Contractor digitally as a portable document (pdf) or a tagged image format (tiff) file delivered electronically.
- E27.4 The sign shall have 6 threaded inserts imbedded into the back and come complete with 6 tamper proof screws.
- E27.5 The sign shall be textured with a semi-matte surface.
- E27.6 The sign shall be graffiti resistant and shall be able to withstand solvent based removal of graffiti without damage to the surface or images.
- E27.7 The sign shall be frost and water resistant.
- E27.8 The sign shall be installed on a pressure treated wooden framework c.w. posts as shown on the drawings.
- E27.9 Location of the sign shall be determined on site by the Contract Administrator.
- E27.10 The sign shall be installed so that its front face is vertical.
- E27.11 Payment for the supply and installation of the sign c.w. all items incidental to and necessary to provide a finished installed sign shall be lump sum.

E28. PATH SIGNAGE

- E28.1 This section shall cover the supply and installation of the path directional signage including sign blanks, vinyl, posts and installation.
- E28.2 Posts shall be Steel to CAN/CSA-G40.21, 3 m long, flanged "U" shaped in cross section, measuring 65 mm wide by 30 mm deep. Metal thickness: 4.5 mm. Hot dipped galvanized: to CAN/CSA-G164
- E28.3 Fasteners: bolts, nuts, washers and other hardware for signs to be cast aluminum alloy, or galvanized steel.
- E28.4 Sign boards to be Aluminum sheet regular grade to 5052, H36, or H38 sheet.

- (a) precut to required dimensions.
 - (b) Thickness to be 2.05 mm (.081") c.w. predrilled mounting holes.
 - (c) All burrs and sharp edges shall be removed.
- E28.5 Vinyl symbols shall be precision computer cut vinyl with an exterior life of between 5 and 7 years.
- (a) Adhesive shall be on back and of a type approved by the vinyl manufacturer.
 - (b) Colors shall be chosen from available standard colors and approved by Contract Administrator.
- E28.6 Steel posts shall be driven to required depth without damage to posts. Posts shall be vertical.
- E28.7 Signs shall be attached with approved fasteners.
- E28.8 Vinyl markings to be applied to sign blank using methods and finishing approved by vinyl manufacturer.
- E28.9 Signs are to be as per the details provided. The detail marking of the signs is to be as per the schedule provided on the drawing.
- E28.10 Sign Contractor is to submit shop drawings and material including colour samples, to Contract Administrator for review and approval prior to fabrication of signs.
- E28.11 Measurement and payment is to be per each as per the schedule of prices. Said price shall be deemed to include all materials and labour incidental and necessary for the complete supply and installation of each sign.