

PART 1 - GENERAL**1.1 Related Work**

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| .1 | Site Grading | Section 02210 |
| .2 | Bunker Construction | Section 02954 |

1.2 Site Conditions

- .1 Contract Administrator to locate all irrigation system lines and any other underground utilities that may interfere with the works. Ensure the location of all irrigation lines and sprinkler heads are staked prior to the start of construction.

1.3 Protection

- .1 Prevent damage to fencing, trees, landscaping, natural features, bench marks, existing buildings, existing pavement, existing cart paths, surface or underground utilities which are to remain. Make good any damage.
- .2 The Contract Administrator or designated representative will designate the area or areas in which the Contractor's activities may take place. The Contractor shall make good any damage caused by their activities within the construction area or areas. The Contract Administrator or designated representative will designate access routes to the designated work areas. The Contractor shall make good any damage caused by their activities along the access routes.

1.4 Supervision and Inspection

- .1 The Contract Administrator will provide the Contractor with preliminary staking for line and grade for all drainage works and will advise and stake all modifications while the works are in progress.
- .2 The Contract Administrator or designated representative will be on site as the majority of excavation and filling operations are being undertaken and will provide directions to the Contractor.

PART 2 - PRODUCTS**2.1 Materials**

- .1 Plastic pipe and fittings: to CGSB 41-GP-29Ma be manufactured from HDPE resin which shall meet the requirements of ASTM D3350 Cell Class 424420C, Big "0" Internal Snap Coupling System pipe (or approved alternate) perforated all around and non-perforated, nominal inside diameter 100 mm (4") or 150 mm (6"), non-perforated couplings (insert type), sleeves, reducers, connectors, T's, elbows, end caps (insert type). Refer to drawings for applicable pipe size and location.

- .2 Non-calcareous pea gravel: rounded and washed, free from clay and silt fines. Soft limestones, sandstones or shale are not acceptable. Particle size distribution:

<u>Particle Size</u>	<u>% Allowable</u>
≥ 12 mm	zero
6 mm to 9 mm	minimum 65%
≤ 2 mm	less than 10%
≤ 1 mm	less than 5%

Materials shall be tested for weathering stability (ASTM - C - 88), and must show a loss of material less than 12% by weight to be acceptable. LA Abrasion Test (ASTM C - 131) for mechanical stability, values must not exceed 40.

- .3 Drainage sand: Washed, non-calcareous sand, angular to sub-angular in shape only.

<u>Particle Size</u>	<u>% Allowable</u>
<0.25 mm	0%
0.25 mm to 0.50 mm	minimum 75%
0.50 mm to 1.00 mm	up to 25%
>1.00 mm	3% max.

- .4 Filter Fabric: permeable woven fabric approved by the Contract Administrator, to required widths and lengths (if required).
- .5 Catch Basins: Nominal inside diameter 150 mm (6"). National Diversified Sales NDS #201, Rainbird DB6R2, (or approved alternate). Nominal inside diameter 300mm (12"). National Diversified Sales NDS #1204, Rainbird DB12KITG (or approved alternate). Refer to drawings for applicable basin size and location. All basins to be complete with green, slotted insert drain covers unless noted otherwise on drawings.
- .6 Anti-Rodent Devices: shall be slotted catch basin lids, the same nominal diameter as the pipe to permit water to escape but to prevent rodents from entering.
- .7 Drainpipe end protection sleeves: Sized to suit application, PVC (13mm [1/2"] min. wall thickness) or HDPE pipe, 600 mm (24") in length. End to be cut on site to match existing slope.

PART 3 - EXECUTION

3.1 Inspection

- .1 Ensure graded subgrade conforms with required drainage pattern before placing drainage material.
- .2 Report to the Contract Administrator where improper slopes, unstable areas, areas requiring additional compaction or other unsatisfactory conditions exist.

- .3 Begin installation of drainage materials after deficiencies have been corrected.

3.2 Installation

- .1 Pipe Laying:
 - .1 Ensure pipe interior and coupling surfaces are clean before laying.
 - .2 Lay pipe to minimum slope, as indicated on drawings, to discharge site.
 - .3 Do not use shims or granular backfill to establish pipe slope.
 - .4 Use manufacturer recommended fittings.
 - .5 Protect pipe ends from damage and ingress of foreign material.
 - .6 Connect pipe to catch basins, sump pit or outlets by appropriate adapters manufactured for this purpose.
- .2 Outlet Protection:
 - .1 Install predrilled polyethylene end cap for rodent protection securely inside end of drainpipe.
 - .2 In areas of play, to protect end of drainpipe from mower damage, place 150 mm (6") or 200 mm (8") diameter, 600 mm (24") length of PVC or HDPE sleeve over end of drain line (see detail 1/L3). Cut end of sleeve at appropriate angle to match existing slope of bank.
- .3 Drainage Trench Backfill:
 - .1 Place pea gravel backfill material after pipe installation is approved by the Contract Administrator. Provide 200 mm (8") minimum cover over all drain lines.
 - .2 Perforated Drainlines: Place a layer of pea gravel backfill by hand to a depth which will allow for a 75mm (3") layer of drainage sand to finish flush with existing turf. Consolidate by hand, tamping lightly. Prevent displacement of pipe.
Solid Drainlines: Place a layer of drainage sand backfill to top of pipe, filling the remainder of trench in 100mm (4") lifts of native soil. Consolidate by hand, tamping lightly to top of trench. Prevent displacement of pipe
 - .3 The Contractor is responsible to make good any settlement that may occur in pipe trenches.

PART 4 - MEASUREMENT AND PAYMENT

4.1 Method of Measurement

- .1 Subgrade Drainage shall be measured separately on a linear meter basis for;
 - a) perforated drain lines
 - b) solid drain lines
 - c) slit trenches

Catch Basin installation will be measured on a per unit basis. The work to be paid for shall be the total number of linear meters of each type installed plus catch basins that are placed in the completed work in accordance with this specification, as staked and/or approved by the Contract Administrator.

4.2 Basis of Payment

- .1 Subgrade Drainage lines and trenches shall be paid for at the Contract Unit Price per linear meter. Catch basins shall be paid for on a per unit installed basis for the "Items of Work" listed below, which price shall be payment in full for supplying and placing all materials herein described and all other items incidental to the work included in the specification.

Items of Work:

- I) Subgrade Drainage