

CW 3120 – INSTALLATION OF SUBDRAINS

TABLE OF CONTENTS

1.	DESCRIPTION.....	1
	1.1 General	1
	1.3 Referenced Standard Construction Specifications	1
	1.4 Referenced Standard Details.....	1
2.	MATERIALS.....	1
	2.1 Approved Products	1
	2.2 Drainage Fabric	1
	2.3 Drainage Material	1
	2.4 Drainage Pipe	2
	2.5 Pipe Appurtenances.....	2
	2.6 Cement Patching Compound.....	2
3.	CONSTRUCTION METHODS	2
	3.1 Trench Excavation	2
	3.2 Installation of Drainage Fabric.....	3
	3.3 Installation of Drainage Pipe.....	3
	3.4 Placement of Drainage Material.....	4
	3.5 Connection of Subdrain to Existing Catchbasins.....	4
4.	MEASUREMENT AND PAYMENT	4

CW 3120 – INSTALLATION OF SUBDRAINS

1. DESCRIPTION

1.1 General

- .1 This specification covers the supply and installation of subdrains, trench excavation, drainage fabric, drainage material, drainage pipe, appurtenances and related work.

1.3 Referenced Standard Construction Specifications

- .1 CW 1130 – Work Site Requirements.
- .2 CW 2130 – Gravity Sewers.
- .3 CW 3110 – Sub-Grade, Sub-Base and Base Course Construction.
- .4 **CW 3130 – Supply and Installation of Geotextile Fabrics**
- .5 Approved Products for Surface Works.

1.4 Referenced Standard Details

- .1 SD-245 – Subdrain Installation Detail.

2. MATERIALS

2.1 Approved Products

- .1 Use only those materials listed as Approved Products for Surface Works. The Approved Products are available in Adobe Acrobat (.pdf) format at the City of Winnipeg, Corporate Finance, Material Management Internet site at: <http://www.winnipeg.ca/matmgt/info.stm>

2.2 Drainage Fabric

- .1 **Drainage Fabric will be non-woven and meet or exceed the requirements of Separation Geotextile Fabric in CW 3130.**

2.3 Drainage Material

- .1 Drainage material will consist of natural gravel, crushed stone or other materials of similar characteristics having clean, hard, strong, durable, uncoated particles free from injurious amounts of soft, friable, thin, elongated or laminated pieces, alkali, organic or other deleterious matter.

- .2 Drainage material will meet the following requirements:

TABLE CW 3120.1 – Drainage Material Grading Requirements

CANADIAN METRIC SIEVE SIZE	PERCENT OF TOTAL DRY WEIGHT PASSING EACH SIEVE
40 000	100%
25 000	50% - 80%
20 000	5% - 20%
12 500	0% - 5%
80	0% - 3%

.1 Soundness

Drainage material when subjected to five cycles of the soundness test will have a weighted loss of not more than 13% percent in accordance with ASTM Standard C88, Test for soundness of Aggregates by Use of Magnesium Sulphate.

.2 Abrasion

Drainage material when subjected to the abrasion test will have a loss of not more than 30% when tested in accordance with grading A of ASTM C131, Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.

2.4 Drainage Pipe

- .1 Supply 150 millimetre diameter gasketed bell and spigot High Density Polyethylene (HDPE) Type SP pipe with Class 2 perforations in accordance with AASHTO M252-07.
- .2 All perforations shall be slotted with a minimum water inlet area of 30 square centimetres per meter of pipe.
- .3 Drainage pipe shall have a minimum stiffness of 320kPa at 5 percent deflection.

2.5 Pipe Appurtenances

- .1 Supply fittings for the drainage pipe, including bends, caps, tees, elbows and couplings in accordance with Section 2.4 of this specification.

2.6 Cement Patching Compound

- .1 Supply cement patching compound in accordance with Section 2.10 of CW 2130.

3. CONSTRUCTION METHODS

3.1 Trench Excavation

- .1 Commence trench excavation after the preparation of the sub-grade has been completed in accordance with CW 3110.
- .2 Excavate trenches to the grade and dimensions shown on the Drawings or as directed by the Contract Administrator.
- .3 Dispose of trench excavation material in accordance with Section 3.4 of CW 1130.

- .4 Repair any non-conforming trenches as directed by the Contract Administrator.

3.2 Installation of Drainage Fabric

- .1 Commence installation of drainage fabric after the trench has been approved by the Contract Administrator.
- .2 Install drainage fabric in the longest continuous practical length, free from tension, stress, folds, wrinkles and creases.
- .3 Install drainage fabric in accordance with this specification and SD-245.
- .4 Overlap joints a minimum of 600 millimetres.
- .5 Install pins and place piles of drainage material as required to hold the drainage fabric in place.
- .6 Wrap the drainage fabric over the top of the backfilled trench and ensure an overlap of 500 millimetres onto the pavement sub-grade.
- .7 Cut drainage fabric as required to accommodate installation around existing gas lines. Patch the cut drainage fabric by overlapping piece of fabric to a minimum 600mm or as recommended by the manufacturer and approved by the Contract Administrator.
- .8 Remove and replace drainage fabric that has been improperly installed or damaged as directed by the Contract Administrator.

3.3 Installation of Drainage Pipe

- .1 Install drainage pipe to line and grade shown on the Drawings or as directed by the Contract Administrator.
- .2 Assemble pipe in accordance with manufacturer's instructions so when complete the drainage pipe will have a smooth and uniform invert.
- .3 Install drainage pipe on 100 millimetres of drainage material ensuring uniform support under bell and pipe body throughout full length.
- .4 Use longest pipe length manufactured where practicable to reduce number of joints on the sub-drain.
- .5 Commence installation of drainage pipe at catchbasin and proceed upgrade.
- .6 Lay drainage pipe with bell upgrade.
- .7 Install drainage pipe with perforations positioned towards bottom of trench.
- .8 Install caps on ends of all sub-drains and secure to drainage pipe in accordance with manufacturer's recommendations.
- .9 Allowable variance from specified line to be +/- 100 millimetres.
- .10 Allowable variance from specified grade to be +/- 25 millimetres.
- .11 Correct alignment and grade exceeding the allowable variance as directed by the Contract Administrator.

3.4 Placement of Drainage Material

- .1 Complete placement of drainage material in 150 millimetre lifts and compact to the satisfaction of the Contract Administrator.
- .2 Place drainage material to ensure no damage occurs to the drainage fabric and drainage pipe.
- .3 Construction traffic will not be allowed to travel over the subdrain trench until a minimum of 150 millimetres of sub-base material has been placed over the completed subdrain trench.

3.5 Connection of Subdrain to Existing Catchbasins

- .1 Connect drainage pipe to existing catchbasins as shown on the Drawings or as directed by the Contract Administrator.
- .2 Cut neat hole in wall of catchbasin to a maximum of 25 millimetres larger than the outside diameter of the drainage pipe.
- .3 Ensure drainage pipe does not protrude more than 150 millimetres beyond inside wall of catchbasin.
- .4 Grout connection of drainage pipe to catchbasin with cement patching compound to form a watertight and structurally sound connection.
- .5 No bends greater than 45° will be permitted to alter the grade or alignment of the drainage pipe for the catchbasin connection.

4. MEASUREMENT AND PAYMENT

- .1 Supply and installation of subdrains will be measured on a length basis and paid for at the Contract Unit Price per metre for "Installation of Subdrains". The length to be paid for will be the total number of metres of subdrains supplied and installed in accordance with this specification, accepted and measured by the Contract Administrator.
- .2 Measurement for the length of subdrain installed will be made horizontally at grade above the centreline of the pipe through fittings from the centre of the catchbasin to the end of the drainage pipe.
- .3 No measurement or payment will be made for drainage fabric or drainage pipe removed or removed and replaced due to improper installation or damaged materials.
- .4 Pipe appurtenances supplied and installed will be included in the payment for "Installation of Subdrains".
- .5 Connecting to existing catchbasins will be included in the payment for "Installation of Subdrains".