

PART 1 - GENERAL

- 1.1 All necessary earth fill and grading (to the grades required) shall be included in the Total Bid Price.
- 1.2 UNSATISFACTORY SOIL CONDITIONS
- .1 Any unsatisfactory or questionable soil conditions revealed during excavation shall be reported immediately to the Contract Administrator.
- .2 All foundation and sub-structural Work shall cease until the condition has been examined and approved to proceed has been issued.
- 1.3 MATERIAL UNSUITABLE FOR BACKFILL
- .1 The Contractor shall be responsible for all costs associated with the excavation and removal of all materials unsuitable for backfill including existing full or partial concrete or stone basements, furnaces, appliances, refuse, etc., caused by previous demolition on the Site. No extras will be paid for the excavation or removal of any or all of the above.
- 1.4 WATER
- .1 Keep excavation free for water at all times. Provide drainage trenches and sumps as necessary and pump water well away from excavation. Do not discharge water onto private property.

PART 2 MATERIALS

- 2.1 GRANULAR MATERIALS
- .1 Gravel Material for installing under building foundations shall be a 19mm diameter crushed limestone and shall meet the following:

<u>Candian Metric Sieve Size</u>	<u>Percent of Total Dry Weight Passing Each Sieve</u>
20 000	100%
5 000	40 - 70%
2 500	25 - 60%
315	8 - 25%
80	6 - 17%

PART 3 APPLICATION

- 3.1 EXCAVATION
- .1 Strip off and store on Site, in a location approved by the Contract Administrator, reuseable topsoil material.
- .2 Excavate to elevations and dimensions required by the Work, to clean lines to remove all existing organic material which is located below the building granular base. Make excavation at the natural angle of repose of soil material.
- .3 Make bearing areas level, free of soft loose, and organic material.
- .4 Maintain water-free excavations.
- .5 Where necessary, brace and shore to withhold earth banks properly in position until permanent Work has been completed, inspected, and approved for backfill.

- .6 Over-excavations shall be filled as follows:
 - .1 Bearing areas - not less than 7MPa concrete
 - .2 Non-bearing areas - clean earth or gravel unless otherwise noted.

3.2 BACKFILL

- .1 Notify the Contract Administrator when Work is ready for inspection. No backfilling against foundation walls shall be done until the Contract Administrator has approved same, and all Work below grade including drains, sewers, weeping drains, waterproofing and dampproofing have been inspected and approved.
- .2 No backfill shall be placed until first floor beams, slabs and/or joists are in place, except for the installation of the clay fill below the Office Building crawl space which is to be installed after the concrete piles are installed, and prior to the grade beam Work, to ensure the clay can be adequately compacted to 100% Modified Proctor Density.
- .3 All fill shall be clean clay for non building bearing areas and clean topsoil may be used for landscaped areas not located under paved areas. No frozen material shall be used.
- .4 Rocks, blocks or concrete and masonry materials no greater in size than 0.03 m³, but no debris, may be used for fill if well distributed in the earth. Such materials shall not be placed against foundation walls or within 450 mm of the top of subgrade level.
- .5 Remove construction debris and rubbish from excavation before backfilling.
- .6 Place clay/earth fill in layers not exceeding 150 mm in lifts for areas not bearing under the buildings, compacted to 95 % Modified Proctor Density to prevent future settlement, to required elevations.
- .7 Avoid damage to the walls and to any dampproofing or waterproofing.
- .8 Backfill to 100 mm below finish grade for areas outside of the buildings to allow for 100 mm depth of topsoil and sod to be installed by others.

3.3 GRANULAR FILL

- .1 Only granular fill is permitted to be used for the base to support the three Storage Buildings. The gravel for the concrete building floor foundations and walls, shall be installed a minimum 1220 mm past all perimeter walls of each storage building, and be installed in maximum 150 mm thick lifts, each layer compacted to 100% Modified Proctor Density.
- .2 Install clay backfill on outside of granular bases in lifts equal to the gravel lifts and compact to retain the gravel.
- 3. Contractor shall pay for and have the density of the subgrade tested by an independent test lab, and submit the results to the Contract Administrator. Sub grade to be tested in one location each for the small storage buildings and four corner locations for the Cold Storage Building.
- 4. Contractor shall pay for and have the density of the top of the gravel foundation supports tested by an independent test lab, and submit the results to the Contract Administrator. Top of Gravel foundation for the storage buildings to be tested in one location each for the small storage buildings, and four corner locations for the Cold Storage Building.
- 5. Contractor shall make good any failed tests until results meet specification requirements. Contractor may only form the concrete foundation Work, when the Contract Administrator has accepted the test results of the gravel compaction.

END OF SECTION

PART 1 - GENERAL

- 1.1 .1 Read in conjunction with Cast in Place Concrete, Section 03300
- .2 Pile layout by concrete Contractor - co-ordinate all Work with concrete Contractor.
- 1.2 EXAMINATION
- .1 Visit Site to determine existing conditions and requirements for protection of adjacent Work, and accept Site and existing Work as it exists at time of commencement of Work. Verify all dimensions at the Site.
- 1.3 INSPECTION AND TESTING
- .1 Notify Contract Administrator and secure approval before placing reinforcing steel and concrete. Provide free use of facilities for inspection of holes and labour to operate same. Issue at least 24 hours notice to the Contract Administrator when inspection will be required.
- .2 Concrete tests will be required in accordance with C.S.A. Standard A23.1 and 2. Testing shall be done at the Contract Administrator's discretion and paid for directly by the The City. If concrete, at 28 days, is less than required, remedial Work will be done as directed by The City's Engineer, to satisfactorily support same load at same point as called for on drawings without additional cost to the The City.
- .3 Concrete testing agency shall be appointed and paid for by the The City.
- .4 If more than one concrete supply source is used, tests apply to each source, and not less than one for each 10 piles, or one for each day on which concrete is placed.
- .5 National Building Code standard load tests may be ordered by the Contract Administrator at extra cost.
- 1.4 SPECIAL PROTECTION
- .1 If ambient temperature during seven (7) days after placing may fall below 4 C (40 F) cover top of each unit with 300 mm (12") depth of loose straw or approved equivalent in accordance with B6 and comply with protection requirements of C.S.A. Standard A-23-1.
- .2 If superimposed Work is to be placed later, protect top of each unit with at least 150 mm (6") damp sand.
- .3 Steel sleeving shall be used to all piles that pass through silt, sand or loose clay. Sleeving shall be extracted only as concrete is placed. All sleeving shall be inspected/supervised by an independent testing agency paid for by the The City.
- .4 If water is encountered in any pile hole, it shall be pumped out as necessary to obtain a dry condition suitable for placing concrete. Do not place concrete in any hole containing water; allow for sleeving, pumping and protection of holes as necessary in the contract price.
- 1.5 FIRM PRICE
- .1 Piles shall be installed in accordance with the specifications through and under any subsurface condition encountered at no additional cost to the The City

PART 2 - PRODUCTS

2.1 MATERIALS

- .1 Reinforcing steel: to C.S.A. Standard G30-1 for intermediate grade. All vertical reinforcing in piles shall be A432 grade 60,000 psi yield. Ties may be intermediate grade. Size of all reinforcing shall be as shown on drawings.
- .2 Concrete: generally in accordance with C.S.A. Standard A-23-1, 1973. Strength at 28 days as shown on drawings slump 125 mm maximum. Maximum aggregate 50 mm. Top 4500 mm of pile to be well vibrated. Type V. Sulphate resistant cement shall be used in all piles. No admixture containing calcium chloride shall be used.

PART 3 - APPLICATION

3.1 EXECUTION

- .1 Install within 50 mm of exact centres set out, plumb alignment and 25 mm in elevation. If these conditions are not met, remove same and/or install whatever additional foundation Contract Administrator directs to correct error, to support same load satisfactorily at location shown on drawings and pay for any additional design costs due to such errors.
- .2 Machine bore piles to depth shown on structural drawings circular and full diameter c/w belled bottom as noted on drawings

3.2 PLACING CONCRETE AND STEEL

- .1 Securely fasten steel during concrete placement.
- .2 Bring top of each unit up to level but roughened surface at elevation shown on plans and form proper seating for structural Work it is intended to support. Each unit shall be vibrated with approved mechanical vibrator. Vibrate top 15'-0" (4500 mm) of all piles.

3.3 CLEAN-UP

- .1 The Contractor shall remove from Site all drill tailings, debris and other materials resulting from or used for Work of this contract.
- .2 Keep all public and private roads clean and free from excavated materials due to spillage or other sources.

END OF SECTION