



**SECTION 'A-A'**  
 $Q_{10} = 114.38$  C.F.S.  
 $Q = 1.486 AR^{2.45}$   
 $N = 0.024$   
 $S = 0.0051/ft.$   
 $A = 22.75$  FT.<sup>2</sup>  
 $R = 22.75 / 1.21 = 1.88$   
 $Q = 115.58$   
 $V = 5.08$  F.P.S.

**SECTION 'B-B'**  
 $Q_{10} = 223.89$  C.F.S.  
 $Q = 1.486 AR^{2.45}$   
 $N = 0.024$   
 $S = 0.0051/ft.$   
 $A = 39.48$  FT.<sup>2</sup>  
 $R = 39.48 / 1.65 = 23.92$   
 $Q = 225.49$  C.F.S.  
 $V = 5.71$  F.P.S.

- GENERAL NOTES**
- A Geotechnical Engineer shall be employed by the owner and be on site during grading operations.
  - The grading contractor shall perform a complete grading and compaction operation as shown on the plans, stated in these notes, or reasonably implied therefrom, all in accordance with the plans and notes as interpreted by the geotechnical engineer.
  - The Contractor shall notify the Soils Engineer at least two days in advance of the start of the grading operation.
  - All areas will be allowed to drain. All low points should be provided with temporary ditches.
  - A sediment control plan that includes monitored and maintained sediment control basins and/or straw bales should be implemented as soon as possible. No graded area is to be allowed to remain bare over the winter without being seeded and mulched. Care should be exercised to prevent soil from damaging adjacent property and silting up existing downstream storm drainage systems.
  - Debris and foundation material from any existing on-site building or structure which is scheduled to be razed for this development must be disposed of off-site, or buried on site.
  - Any existing trash and debris currently on this property must be removed and disposed of off-site, or buried on site.
  - Soft soils in the bottom and banks of any existing or former pond site should be removed, spread out and permitted to dry sufficiently to be used as fill. None of this material should be placed in proposed public right-of-way locations, or on storm sewer locations.
  - Site preparation includes the clearance of all stumps, trees, bushes, shrubs, and weeds; the grubbing and removal of roots and other surface obstructions from the site; and the demolition and removal of any man-made structures. The unsuitable material shall be properly disposed of off-site. Topsoil and grass in the fill areas shall be thoroughly disced prior to the placement of any fill. The Soils Engineer shall approve the disking operation.
  - Compaction equipment shall consist of tamping rollers, pneumatic-tired rollers, vibratory rollers, or high speed impact-type drum rollers acceptable to the Soils Engineer. The roller shall be designed so as to avoid the creation of a layered fill without proper blending of successive fill layers.
  - The Soils Engineer shall observe and test the placement of the fill to verify that specifications are met. A series of fill density tests will be determined on each lift of fill. Interim reports showing fill quality will be made to the Owner at regular intervals.
  - The Soils Engineer shall notify the Contractor of rejection of a lift of fill or portion thereof. The Contractor shall rework the rejected portion of fill and obtain notification from the Soils Engineer of its acceptance prior to the placement of additional fill.
  - All areas to receive fill shall be scarified to a depth of not less than 6 inches and then compacted to at least 85 percent of the maximum density as determined by the Modified AASHTO T-99 Compaction Test (ASTM-D-1557). Natural slopes steeper than 1 vertical to 5 horizontal to receive fill shall have horizontal benches, with minimum widths of 10 feet and maximum heights of 4 feet, cut into the slopes before the placement of any fill. The fill shall be loosely placed in horizontal layers not exceeding 8 inches in thickness and compacted in accordance with the specifications given below. The Soils Engineer shall be responsible for determining the acceptability of soils placed. Any unacceptable soils placed shall be removed at the Contractor's expense.
  - The sequence of operation in the fill areas will be fill, compact, verify acceptable soils density, and repetition of the sequence. The acceptable moisture contents during the filling operation are those at which satisfactory dry densities can be obtained. The acceptable moisture contents during the filling operation in the remaining areas are from 2 to 8 percent above the optimum moisture content.

- The surface of the fill shall be finished so that it will not impound water. If at the end of a days work it would appear that there may be rain prior to the next working day, the surface shall be finished smooth. If the surface has been finished smooth for any reason, it shall be scarified before proceeding with the placement of succeeding lifts. Fill shall not be placed on frozen ground, nor shall filling operations continue when the temperature is such as to permit the layer under placement to freeze.
  - Fill and backfill should be compacted to the criteria specified in the following table:
- | CATEGORY                               | MINIMUM PERCENT COMPACTION |
|--|----------------------------|
| Fill in building areas below footings  | 90%                        |
| Fill under slabs, walks, and pavements | 88%                        |
| Fill other than building areas         | 88%                        |
| Natural subgrade                       | 88%                        |
| Pavement subgrade                      | 90%                        |
| Pavement base course                   | 90%                        |
- Measured as a percent of the maximum dry density as determined by modified Proctor test (ASTM-D-1557).
- Moisture content must be within 2 percent below or 4 percent above optimum moisture content if fill is deeper than 10 feet.
- NOTE: Trash and debris shall be disposed of in the detention basin area and other designated areas. All debris shall be buried a minimum of 3 feet below finished grade.

BID YARDAGE	Cu Yds.
CUT	94,800
FILL	94,800
(INCLUDES 12.79% SHRINKAGE)	

**DRAINAGE AREA MAP**

NOTE: THIS PLAN IS FOR DRAINAGE AREA PURPOSES ONLY. NOT FOR CONSTRUCTION.

NOTE: PERMISSION FROM MO STATE HIGHWAY AND TRANSPORTATION DEPT. IS REQUIRED BEFORE GRADING IN R.O.W.