Retaining walls can be constructed to alter a slope's parameters. The top of the retaining wall constitutes the toe of the slope, and slope height is determined from the top of wall. Downslope setback requirements can be reduced to zero if the retaining wall reduces the upslope gradient to 3:1 or flatter. Because upslope setbacks are determined at footing elevation, top of slope setbacks can be managed through the footing depth. In some cases it may be desirable to use a foundation based on tip bearing piles or caissons, to achieve greater footing depths.

FOUNDATION AND PAVEMENT DISCUSSION AND RECOMMENDATIONS

General Notes:

Presently, approximately 89 lots are proposed for the project site. Considering typical residential construction, and subsurface conditions, it is recommended that the structures be founded upon conventional spread footings and continuous wall footings. **The following recommendations are not specific to the individual structures, but rather should be viewed as guidelines for the subdivision wide development.**

Foundation Design Recommendations:

On the basis of data obtained from the site and test results from various laboratory tests performed, MTI recommends following guidelines be used for the net allowable soils bearing capacity.

Footing Depth	ASTM D 1557 Subgrade Compaction	Net Allowable Soils Bearing Capacity
Footings should bear on competent, native, silty sand soils present at below the root zone across the site. Excavation depths of 2 feet should be anticipated.	Not required for native soil	1,500 lbs/ft^2

[1]**Verification of bearing soils for each residence by a qualified geotechnical engineer at the time of construction is recommended.**

Footings should be proportioned to meet the stated bearing capacity and/or the IBC 2000 minimum requirements. Total settlement should be limited to about 1 inch with differential settlement of approximately 1/2 inch. Objectionable soil types encountered at the bottom of footing excavations should be removed and replaced with structural fill. Excessively loose or soft areas that are encountered in the footing subgrade will require over-excavation and backfilling with structural fill. To minimize the effects of slight differential movement that may occur because of variations in character of supporting soils, and in seasonal moisture content, MTI recommends continuous footings be suitably reinforced to make them as rigid as possible. For frost protection, the bottom of external footings should be 30 inches below finished grade.

Crawl Space Recommendations:

Considering the likely presence of shallow groundwater in the southern portion of the site, all residences constructed within this area should be designed in a manner that will inhibit water in the crawl spaces. Shallow groundwater conditions can lead to standing water in crawlspaces, allowing for development of mold and associated issues. Therefore, proper grading should be considered to be critical. MTI recommends that roof drains carry storm water at least 5 feet away from the residence, and grades should be greater than 2% for a distance of 10 feet away from all residences. In addition, rain gutters should be placed around all sides of residences, and backfill around stem walls should be placed and compacted in a controlled manner.

In addition, based on observed soil and groundwater conditions, MTI recommends that crawl spaces be located a minimum of 24 inches above the seasonal high groundwater elevation. This would reduce the possibility of water seeping into crawlspaces in the future. Considering an estimate of seasonal high groundwater at approximately 4 feet below grade, crawl spaces should not extend deeper than approximately 2 feet below existing grade. This depth recommendation is not considered applicable within the topographically lower drainages present in the western portion of the site. It is the understanding of MTI that no residences will be constructed within these drainages.

Recommended Pavement Sections:

MTI collected a sample of near-surface soils for R-value testing representative of soils to depths of 2 feet below existing ground surface. A bulk sample collected from the northwestern portion of the site, consisted of silty sand soil. This sample yielded an R value of 32. MTI has used a traffic index of 6 to determine necessary pavement cross-sections for local/residential streets and a traffic index of 8 for collector/arterial streets. Additionally, MTI has made other assumptions for traffic loading variables based on the character of the proposed construction. The Client should review these assumptions to make sure they reflect intended use and loading of pavements both now and in the future.

Flexible Pavement Sections

The Idaho Method as defined in Idaho Department of Transportation's Materials Manual (section 500) was used to develop the pavement section. Ada County Highway District (ACHD) parameters for traffic index and substitution ratios were also used in the design, and were obtained from ACHD's Development Policy Manual. These values were used as a reference. Calculation sheets provided in the Appendix indicate the soils values, traffic loading, and material ratios used to calculate the pavement sections. MTI recommends that all materials used in the construction of Asphaltic Concrete Pavements meet the requirements of the Idaho State Public Works Construction (ISPWC) specifications. Construction of the pavement section should be in accordance with these specifications. The following thicknesses are MINIMUM THICKNESSES for assured pavement function.