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M E M O R A N D U M

TO: Public Works Committee

FROM: Brad Solon, Building Official

DATE: November 2, 2010

SUBJECT: PW102610-16 – Residential Construction Backfill Requirements

Staff researched the matter of foundation backfill for one and two-family dwellings. Six jurisdictions were contacted. Sioux Falls, Spearfish, Gillette, Saint Paul and Billings perform no inspections of the placement or compaction of backfill around foundations.

Staff contacted the ICC Upper Great Plains President, Greg Johnson from Saint Paul. Mr. Johnson stated that several jurisdictions in Minnesota require an engineered design and inspections of foundations. Mr. Johnson did not identify any of those jurisdictions and was not aware of any jurisdictions with standards for backfill.

The City of Gillette, Wyoming requires an engineered plan for a foundation for a single-family dwelling and they have done so for many years. The plan must show proper soils, foundation elevation, the structural details, drainage and final approval by the engineer. The City of Gillette does not require any specific requirements or inspections for the backfill of the foundation.

Meade County has recently adopted a new construction ordinance. Part of the new ordinance regulates compaction of fills. The standards specified in the ordinance describe stringent requirements for backfill. The ordinance requires properly placed backfill done in lifts, compacted to a specific density. Compaction tests are required. The ordinance states that the inspector can require the removal of any backfill for any reason at the expense of the contractor. The Deputy Director of Planning and Zoning stated that the rule is being enforced and that inspections by Meade County will be required in the near future.

Staff believes that if the Public Works Committee recommends that the Residential Code be amended, the amendment should state that compaction should be somewhat less than the Meade County ordinance. The reason is that 95% compaction can damage the new foundation. Also, to have City Staff inspect the backfill would require an inspector to view the compaction in 4" lifts in the field. This is not feasible. A City Staff inspector would have to be on site viewing the compaction as it is placed. The placement of the backfill could take from a few hours to more than one day. The contractor should be required to hire an inspector, preferably the same company that performs the compaction tests. By simply requiring the compaction tests and proper placement of fill material, other problems associated with foundation construction would be ignored.

Other factors are site soils, drainage, foundation elevation, structural aspects of the concrete, the placement of the concrete, the sub-grade at the basement floor, and final foundation approval.

Staff believes that generally, contractors are currently compacting the backfill around foundations in a suitable manner. Staff receives more complaints on the sub-grade under the basement floor (causing settling or heaving), some foundation settling or heaving, and poor drainage. Only occasionally does staff receive complaints regarding the backfill of the foundation.

Staff recommends that the Public Works Committee accept the recommendation of the Rapid City Residential Contractor Board and make no changes to the adopted Residential Code since Staff receives very few complaints regarding residential backfill around foundations.

However, if the Committee recommends approval of an amendment to the Residential Code, Staff believes that all of the foundation criteria be included, not just backfill. Requiring only the engineered backfill would avoid the more common problems associated with foundation construction, since the majority of complaints would not be addressed by simply requiring the testing and placement of backfill.