HIGHWAY DEPARTMENT ROAD AND BRIDGE

DESIGN AND CONSTRUCTION PROCEDURE

Road and Bridge reconstruction improvements are prioritized base on public input, public hearings, engineering judgment and availability of funding sources. Once a project has been approved and scheduled on the County's five year construction program the County Engineer is directed to begin preliminary surveys used for design. The following is a recap of this procedure:

PRELIMINARY SURVEYS

1. PRELIMINARY MAPPING SURVEY

Map the entire area where the new road construction will take place to enable establishment of the new highway location.

2. BENCH MARKS

Establish bench marks every 1000 feet over the entire project length, referenced to sea level elevation.

3. ALIGNMENT

Establish the new alignment of the highway on the entire length of the project, including public road connections.

(1) Measure and establish survey points every 100 feet.

(2) Set reference points to preserve the new road alignment (approximately 30 per mile).

4. PROPERTY CORNERS

Locate all existing property corners adjacent to the new highway and reference them to the new centerline.

5. TOPOGRAPHY

Reference all physical land features to the new highway centerline (buildings, fences, trees, driveways, road connections, wetland, lakes, rivers, utility poles, cables, pedestals, culverts, etc.) to a point 100 feet (minimum) on each side of the new highway centerline.

6. CROSS SECTIONS

Establish sea level elevations of the existing ground surface every 30 - 50 feet to a point 100 feet on each side of the new highway centerline over the entire project length, (approximately 115 cross sections per mile).

7. SOILS SURVEY

Soil borings are taken with a drill rig and by hand auger to a point 100 feet on each side of the new highway centerline, (a minimum of 25 borings per mile), and the soils classified.

8. SWAMP SOUNDINGS

The depth of the muck and peat material is measured in all wetlands and rivers within 100 feet of the new highway centerline. (approximately 30 soundings per acre).

9. RIGHT OF WAY ACQUISITION

The right of way and slope easement limits of the new highway including property lines, are staked every 100 feet (minimum) on each side of the highway for appraisal of the property and right of way negotiations.

10. ADDITIONAL SURVEYS

Highway and Bridge construction projects which affect wetlands, lakes and rivers require additional surveys and attention to determine the total impact to the area. This data is needed to obtain permits from the Minnesota Department of Natural Resources and the U.S. Army Corps of Engineers and also for notifying the other agencies that may be involved with the proposed construction (Minnesota Pollution Control Agency, State Historic Preservation Officer, etc.) Along with permits there may be reports required to be written describing certain environmental issues which at the minimum take 60 days for review.

CONSTRUCTION SURVEYS

1. PRIOR TO CONSTRUCTION OPERATIONS

(1) Re-establish the new highway centerline (set survey points every 100 feet on the new centerline).

(2) Set stakes to mark the limits of tree and brush removal at the right of way limits (approximately 150 stakes per mile).

2. AFTER COMPLETION OF THE TREES AND BRUSH REMOVAL

(1) Re-establish the new highway centerline, (the centerline established in step No. 1 is partially destroyed during the tree and brush removal operations).

(2) Set construction stakes:

A. Centerline reference stakes are set every 100 feet on each side of the new highway beyond the construction limits to enable the contractor to locate the new highway centerline, shoulder and ditch bottom elevation.

B. Slope stakes are also set every 100 feet (minimum) on each side of the new highway centerline which establish the cut or fill point of the new construction.

C. Stakes are set at all new cross culverts which indicate the location and elevation of the inlet and outlet of the culvert.

D. Additional stakes are set in various areas for curb and gutter and storm sewer construction and other special construction items.

3. WHEN THE EARTHWORK PORTION OF THE CONSTRUCTION IS NEAR

COMPLETION

Stakes (blue tops) are set on the new highway centerline and shoulder line every 100 feet (minimum) and driven to the elevation indicated in the construction plans. The "blue tops" are then used by the contractor to perform the final finish to the new highway prior to constructing the aggregate base and bituminous surface materials.

4. EROSION CONTROL

When the finishing of the slopes and ditch bottoms and replacement of the topsoil are complete, sodding stakes are set for the contractor to place sod on various areas of the shoulders and ditch bottoms to prevent erosion. Stakes are also set for other erosion control materials such as straw mulch, rock riprap, etc.

5. WHEN THE PROJECT IS COMPLETE

Final measurements are taken on the contract items to determine a overrun or underrun of quantity, such as borrow pits, concrete items, sod, seeding, etc. to arrive at final payment for the contractor.

If the many trips and time element involved with a new project from start to finish is much longer then seems reasonable, then I hope this article will be helpful in understanding the Highway Department's assigned responsibilities to reconstruct a road or bridge.

By: Hubbard County Highway Department Employees