UG ALIGNMENT PLAN

UG ALIGNMENT PROFILE

HOR. SCALE: 1"=30'
VER. SCALE: 1"=10'

BORING DEPTH 20.5'
DEPTH TO ROCK 13.0'
THERMAL RESISTIVITY 70

PRELIMINARY - NOT FOR CONSTRUCTION
UG ALIGNMENT PLAN

UG ALIGNMENT PROFILE

ELEV. SCALE: 7"=1'

PRELIMINARY - NOT FOR CONSTRUCTION
UG ALIGNMENT PLAN

UG ALIGNMENT PROFILES

SHEET NO:

CONSTRUCTION ACTIVITY:

CORRESPONDING TRAFFIC CONTROL LAYOUT (BY SHEET NUMBERS)

NRTHC125

UG ALIGNMENT PROFILES

SCALE: 1"=30'

HOR. SCALE: 1"=30'

VER. SCALE: 1"=10'

THE NORTHERN PASS

NRTH

NRTH

PRELIMINARY - NOT FOR CONSTRUCTION
BORING STA 325+16.7
BORING DEPTH 20.0'
ROCK NOT ENCOUNTERED
THERMAL RESISTIVITY 60
BORING V

STA 380+57.0

BORING DEPTH 21.0'

ROCK NOT ENCOUNTERED

THERMAL RESISTIVITY 80

PRELIMINARY - NOT FOR CONSTRUCTION

Transmission Business

THE NORTHERN PASS

NRTH

NRTHC144

UG ALIGNMENT PLAN

SCALE: 1"=30'

UG ALIGNMENT PROFILE

HOR. SCALE: 1"=30'

VER. SCALE: 1"=10'
Table 6C.1 Recommended Advance Warning Sign Minimum Spacing

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance Between Signs</th>
<th>A</th>
<th>B</th>
<th>C</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban (low speed?)</td>
<td>100 feet</td>
<td>100</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Urban (high speed?)</td>
<td>300 feet</td>
<td>300</td>
<td>300</td>
<td>300</td>
</tr>
<tr>
<td>Rural</td>
<td>500 feet</td>
<td>500</td>
<td>500</td>
<td>500</td>
</tr>
<tr>
<td>Expressway / Freeway</td>
<td>1,000 feet</td>
<td>1,000</td>
<td>1,000</td>
<td>2,640</td>
</tr>
</tbody>
</table>

1. Speed category to be determined by the highway agency.
2. The column headings A, B, and C are the dimensions shown in Figures 6C-1 through 6C-6. The A dimension is the distance from the location or point of restriction to the first sign. The B dimension is the distance between the first sign and the next sign. The C dimension is the distance between the last sign and the end of the construction zone. The "third sign" is the sign that is furthest upstream from the TCC zone.
Table 6C-1. Recommended Advance Warning Sign Minimum Spacing

<table>
<thead>
<tr>
<th>Road Type</th>
<th>Distance Between Signs (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban (low speed)</td>
<td>A</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Urban (high speed)</td>
<td>350</td>
</tr>
<tr>
<td>Rural</td>
<td>500</td>
</tr>
<tr>
<td>Expressway/Freeway</td>
<td>1,000</td>
</tr>
</tbody>
</table>

* Speed category to be determined by the highway agency.
* The column headings A, B, and C are the dimensions drawn in Figures 8 through 12. The A dimension is the distance from the obstruction point of restriction to the first sign. The B dimension is the distance between the first and second signs. The C dimension is the distance between the second and third signs. For road types, the first number is the urban category, and the second number is the rural category. For expressway/freeway, the first number is the urban category, and the second number is the rural category.

Table 6C-4. Formulas for Determining Taper Length

<table>
<thead>
<tr>
<th>Speed (mi/h)</th>
<th>Taper Length (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 or less</td>
<td>L = 100 (speed - 40)</td>
</tr>
<tr>
<td>50 or more</td>
<td>L = 50 (speed - 50)</td>
</tr>
</tbody>
</table>

Where:

L = length of taper
S = speed of travel
0.8S = estimated speed, or refers to posted speed limit prior to work start, or the anticipated operating speed in mph

Quick Reference Tables

TYPICAL DAILY TEMPORARY ROAD CLOSURE FOR DETOUR LOCATIONS
NOT TO SCALE

END ROAD WORK
G20-2

WORK ZONE
BUFFER A B C

UTILITY WORK AHEAD
W3-4 W2-7

WORK ZONE
BUFFER A B C

UTILITY WORK AHEAD
W3-7 W2-7

FLAGGERS SHALL HELP DIRECT LOCAL TRAFFIC SAFELY TO DETOUR AND/OR THROUGH WORK ZONE TO ACCESS ALL EXISTING SIDE ROADS AND DRIVeways

LEGEND
- REFLECTORIZED PLASTIC DRUM
- EXISTING TRAVEL LANE
- PROPOSED TRAVEL LANE
- PROPOSED SIGN
- WORK ZONE
- FLAGGER
- TYPE 3 BARRICADE

S = SPACING OF REFLECTORIZED PLASTIC DRUM SPACING SHALL EQUAL THE POSTED SPEED LIMIT. (EXAMPLE: 35 MPH SPEED LIMIT = 35' DRUM SPACING)
Table 6C-1. Recommended Advance Warning Sign Minimum Spacing

<table>
<thead>
<tr>
<th>Root Type</th>
<th>Distance Between Signs (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban (low speed)</td>
<td>A</td>
</tr>
<tr>
<td>100 feet</td>
<td>100</td>
</tr>
<tr>
<td>Urban (high speed)</td>
<td>350</td>
</tr>
<tr>
<td>Rural</td>
<td>500</td>
</tr>
<tr>
<td>Expressway / Freeway</td>
<td>1,000</td>
</tr>
</tbody>
</table>

Table 6C-3. Taper Length Criteria for Temporary Traffic Control Zones

<table>
<thead>
<tr>
<th>Type of Taper</th>
<th>Taper Length (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Temporary</td>
<td>80% of Driveway Width</td>
</tr>
<tr>
<td>Oversize Taper</td>
<td>100% of Driveway Width</td>
</tr>
<tr>
<td>Oversize Reflect.</td>
<td>110% of Driveway Width</td>
</tr>
</tbody>
</table>

Table 6C-4. Formulas for Determining Taper Length

<table>
<thead>
<tr>
<th>Speed (mph)</th>
<th>Taper Length (in feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 25</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>25 to 30</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>30 to 40</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>40 to 50</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>50 to 60</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>60 to 70</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>70 to 80</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>80 to 90</td>
<td>x = 10 + 0.50d</td>
</tr>
<tr>
<td>90 to 100</td>
<td>x = 10 + 0.50d</td>
</tr>
</tbody>
</table>

Note: For values of x greater than 100, taper length (L) = 10 + 0.50d. For values of x less than 100, taper length (L) = 10 + 0.50d.
LEGEND

DETOUR ROUTE

ROLLING WORK ZONE
BETWEEN LIMITS OF WORK
(NOT TO EXCEED 1600')

UNDERGROUND ALIGNMENT

SEE NRTHCP-6b FOR FURTHER DETAIL

SEE NRTHCP-6c FOR FURTHER DETAIL

DETOUR ROUTE
(2.7 MILES)

STEWARTOWN
CLARKSVILLE

ROUTE 143

OLD COUNTY ROAD

LIMIT OF WORK

LIMIT OF WORK

PRELIMINARY - NOT FOR CONSTRUCTION
DETOUR 1
INTERSECTION OF ROUTE 145 AND
OLD COUNTY ROAD
DETOUR 1
INTERSECTION OF ROUTE 145 AND CREAMPOKE ROAD
DETOUR 1
INTERSECTION OF CREAMPOKE ROAD AND NORTH HILL ROAD
WORK ZONE BETWEEN DETOUR 1 AND DETOUR 2
INTERSECTION OF OLD COUNTY ROAD AND CREAMPOKE ROAD
LEGEND

DETOUR ROUTE

ROLLING WORK ZONE

SEE NRTHTCP-Bd FOR FURTHER DETAIL

DETOUR ROUTE (4.4 MILES)

ROUTE 145

CRESPINE ROAD

OLD COUNTY RD

BEAR ROCK ROAD

LIMIT OF WORK

UNDERGROUND ALIGNMENT

ROLLING WORK ZONE BETWEEN LIMITS OF WORK (NOT TO EXCEED 1600')

LIMIT OF WORK

NORTH HILL ROAD

SEE NRTHTCP-Bd FOR FURTHER DETAIL

PRELIMINARY - NOT FOR CONSTRUCTION
DETOUR 2
INTERSECTION OF NORTH HILL ROAD AND CREAMPOKE ROAD
DETOUR 2
INTERSECTION OF ROUTE 145 AND
CREAMPOKE ROAD
DETOUR 2
INTERSECTION OF ROUTE 145 AND BEAR ROCK ROAD
DETOUR 2
INTERSECTION OF NORTH HILL ROAD AND BEAR ROCK ROAD
DETOUR 3
INTERSECTION OF BEAR ROCK ROAD AND HEATH ROAD
DETOUR 3
INTERSECTION OF BEAR ROCK ROAD AND
E. COLEBROOK ROAD
DETOUR 3
INTERSECTION OF MOHAWK ROAD (ROUTE 26)
AND E. COLEBROOK ROAD
DETOUR 3
INTERSECTION OF MOHAWK ROAD (ROUTE 26)
AND DANIEL WEBSTER HWY (ROUTE 3)
DETOUR 3
INTERSECTION OF DANIEL WEBSTER HWY (ROUTE 3)
AND PARK STREET (ROUTE 145)
DETOUR 3
INTERSECTION OF ROUTE 145 AND
BEAR ROCK ROAD
DETOUR 3
INTERSECTION OF DANIEL WEBSTER HWY (ROUTE 3)
AND PARK STREET (ROUTE 145)
NOTES:

GENERAL

1. VERIFY ALL DIMENSIONS AND ELEVATIONS SHOWN ON THESE PLANS PRIOR TO INSTALLING THE ALIGNMENTS. IF DISCREPANCIES ARE NOTED, NOTIFY BRIERLEY SO THAT APPROPRIATE REVISIONS CAN BE MADE TO THE HDD DESIGN.

2. IF UTILITIES WILL INTERFERE WITH INSTALLATION OF THE ALIGNMENTS AS SHOWN ON THESE DRAWINGS, NOTIFY BRIERLEY SO THAT APPROPRIATE REVISIONS CAN BE MADE TO THE HDD DESIGN.

3. PERFORM HDD CONSTRUCTION IN ACCORDANCE WITH THE CONTRACT REQUIREMENTS AND CONFORM TO ALL APPLICABLE SAFETY REGULATIONS INCLUDING THE PROVISIONS OF FEDERAL OSHA.

4. PROVIDE PROTECTIVE BARRIER AROUND ALL EXCAVATIONS THAT CONFORMS TO ALL APPLICABLE SAFETY REGULATIONS.

5. ALL UTILITIES DISCOVERED DURING DESIGN ARE INDICATED ON THE PROJECT DRAWINGS. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION, SIZE AND ELEVATION OF ALL EXISTING UTILITIES PRIOR TO THE START OF ANY CONSTRUCTION. ALL UTILITIES WITHIN 15 FEET OF THE DRILL PATH SHALL BE EXPOSED AND PROTECTED DURING CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IN WRITING OF ANY UTILITIES FOUND INTERFERING WITH THE PROPOSED CONSTRUCTION AND APPROPRIATE REMEDIAL ACTION AGREED TO BY THE ENGINEER BEFORE PROCEEDING WITH THE WORK.

6. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING DIGSAFE AT 811, AT LEAST 72 HOURS BEFORE DIGGING OR DRILLING AND SHALL MAINTAIN AN ACTIVE PERMIT DURING ALL SUBSURFACE WORK. A COPY OF THIS PERMIT SHALL BE ON SITE AND AVAILABLE FOR VIEWING BY THE OWNER AND OWNER'S REPRESENTATIVES DURING ALL SUBSURFACE WORK.

7. REFER TO TEST BORING LOGS FOR SPECIFIC DETAILS OF SUBSURFACE CONDITIONS ENCOUNTERED.

8. ACTUAL SOIL CONDITIONS MAY VARY SIGNIFICANTLY FROM THOSE INDICATED ON THE PROFILES. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR REVIEWING EXISTING SUBSURFACE INFORMATION, AND SELECTING THE APPROPRIATE MEANS AND METHODS FOR COMPLETING THE WORK.

9. THE SUBCONTRACTOR SHALL VERIFY PROJECT COORDINATES, AZIMUTHS AND ELEVATIONS PRIOR TO CONSTRUCTION.

10. ALL DIRECTIONAL DRILLING SHALL BE COMPLETED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, AND SPECIFICATION SECTION 16840 - HORIZONTAL DIRECTIONAL DRILL INSTALLATION.

11. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTAINMENT, CLEANUP AND DISPOSAL OF ALL DRILLING FLUIDS IN ACCORDANCE WITH APPROVED DRILL FLUID MANAGEMENT AND CONTINGENCY RELEASE PLAN, INCLUDING INADVERTENT SURFACE RETURNS.

12. SUBCONTRACTOR SHALL BE RESPONSIBLE FOR ALL NECESSARY TRAFFIC CONTROL.

13. THE PLANS AND PROFILES WERE DEVELOPED INCORPORATING THE INFORMATION AVAILABLE AT THE TIME OF DESIGN.
Transmission Business

THE NORTHERN PASS

NRTH 001-2

NRTH

PRELIMINARY - NOT FOR CONSTRUCTION

HDD 001 ENTRY AREA WORK SPACE

HDD 001 EXIT AREA WORK SPACE

DETAIL A - HDD 001 DUCT BUNDLE

SCALE: 1"=60'

SCALE: 1"=30'

SCALE: N.T.E.

NORTHWEST ANGLE

SOUTHEAST ANGLE

SOUTHWEST ANGLE

NORTH ANGLE

SOUTH ANGLE

NORTH CENTERLINE

SOUTH CENTERLINE

DETAIL A - HDD 001 DUCT BUNDLE

SCALE: N.T.E.
Transmission Business

THE NORTHERN PASS

NRTH005-2 NRTH

PRELIMINARY - NOT FOR CONSTRUCTION

30' 0' 10' 20'

30'

SCALE: 1"=30'

HDD 005 ENTRY AREA WORK SPACE

HDD 005 EXIT AREA WORK SPACE

60' 0' 20' 40'

SCALE: 1"=60'

DETAIL A - HDD 005 DUCT BUNDLE

SCALE: N.T.E.
Transmission Business
THE NORTHERN PASS
NRTH007-2
NRTH
PRELIMINARY - NOT FOR CONSTRUCTION

HDD 007 ENTRY AREA WORK SPACE
SCALE: 1"=30'

HDD 007 EXIT AREA WORK SPACE
SCALE: 1"=60'

DETAIL A - HDD 007 DUCT BUNDLE
SCALE: N.T.S.