CABARRUS COUNTY

LOCATION: US 29 / US 601 FROM SOUTH OF SR 1394 (POPLAR TENT ROAD) AND MCGILL AVE. TO NORTH OF SR 1394 (POPLAR TENT ROAD) AND MCGILL AVE.

TYPE OF WORK: GRADING, DRAINAGE, PAVING, RESURFACING, SIGNALS, SIGNING, TRAFFIC CONTROL, PAVEMENT MARKINGS, UTILITIES, RETAINING WALL, AND EROSION CONTROL

BEGIN CONSTRUCTION
POC Sta. 15 + 50.00 (~Y^-)

BEGIN CMAQ PROJECT C-4918A
POT Sta. 10 + 06.00 (~L^-)

END CMAQ PROJECT C-4918A
POT Sta. 25 + 94.00 (~L^-)

END CONSTRUCTION
POT Sta. 28 + 06.00 (~Y^-)
CONVENTIONAL PLAN SHEET SYMBOLS

RAILROADS:
Standard Gauge
RR Signal Headlight
Switch
RR Abandoned
RR Discontinued

RIGHT OF WAY:
Base Line
Control Point
Existing Right of Way Marker
Existing Right of Way Line
Proposed Right of Way Line
Proposed Right of Way Line with Iron Pin and Cap Marker
Proposed Right of Way Line with Concrete or Granite Marker
Existing Control of Access
Proposed Control of Access
Existing Easement Line
Proposed Temporary Easement Line
Proposed Permanent Easement Line
Proposed Temporary Drainage Easement
Proposed Permanent Drainage Easement
Proposed Permanent Easement / Utility Easement
Proposed Permanent Utility Easement
Proposed Temporary Utility Easement
Proposed Aerial Utility Easement
Proposed Permanent Easement with Iron Pin and Cap Marker

ROADS AND RELATED FEATURES:
Existing Edge of Pavement
Existing Curv
Proposed Slope Striations Cut
Proposed Slope Striations Fill
Proposed Curb Ramp
Curb Cut Future Ramp
Existing Metal Grate
Proposed Guardrail
 Existing Cable Guardrail
Proposed Cable Guardrail
Equilibrium Symbol
Pavement Removal

VEGETATION:
Single Tree
Single Shrub
Hedge
Woods Line

EXISTING STRUCTURES:
MAJOR:
Bridge, Tunnel or Box Culvert
Bridge Wing Wall, Headwall and End Wall
Pipe Culvert
Footbridge
Drainage Box Catch Basin, DI or JB
Paved Ditch Gutter
Storm Sewer Manhole
Storm Sewer

UTILITIES:
POWER:
Existing Utility Pole
Proposed Utility Pole
Existing Joint Use Pole
Proposed Joint Use Pole
Power Manhole
Power Line Tower
Power Transformer
UG Power Cable Hand Hole
H-Frame Pole
Recorded UG Power Line
Designated UG Power Line (S.U.E.)

TELEPHONE:
Existing Telephone Pole
Proposed Telephone Pole
Telephone Manhole
Telephone Box
Telephone Pedestal
Telephone Cold Tower
UG Telephone Cable Hand Hole
Recorded UG Telephone Cable
Designated UG Telephone Cable (S.U.E.)
Recorded UG Telephone Conduit
Designated UG Telephone Conduit (S.U.E.)
Recorded UG Fiber Optics Cable
Designated UG Fiber Optics Cable (S.U.E.)

WATER:
Water Main
Water Meter
Water Valve
Water Hydrant
Recorded UG Water Line
Designated UG Water Line (S.U.E.)
Above Ground Water Line

TV:
TV Satellite Dish
TV Pedestal
TV Tower
UG TV Cable Hand Hole
Recorded UG TV Cable
Designated UG TV Cable (S.U.E.)
Recorded UG Fiber Optics Cable
Designated UG Fiber Optics Cable (S.U.E.)

GAS:
Gas Valve
Gas Meter
Recorded UG Gas Line
Designated UG Gas Line (S.U.E.)
Above Ground Gas Line

SANITARY SEWER:
Sanitary Sewer Manhole
Sanitary Sewer Chili
UG Sanitary Sewer Line
Above Ground Sanitary Sewer
Recorded SS Force Main Line
Designated SS Force Main Line (S.U.E.)

Miscellaneous:
Utility Pole
Utility Pole with Base
Utility Located Object
Utility Traffic Signal Base
Utility Unknown UG Line
UG Tank: Water, Gas, Oil
Underground Storage Tank, Approx. Loc.
A/G Tank: Water, Gas, Oil
Environmental Boring
UG Test Hole (S.U.E.)
Abandoned According to Utility Records
End of Information

AATUR
E.O.I.
PAVEMENT SCHEDULE

C1  PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE 60.00, AT AN AVERAGE RATE OF 180 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.

C2  PROP. APPROX. 9" ASPHALT CONCRETE SURFACE COURSE, TYPE 60.00, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.

D1  PROP. APPROX. 9" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 219.00, AT AN AVERAGE RATE OF 242 LBS. PER SQ. YD.

D2  PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 219.00, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.

E1  PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE 80S.00, AT AN AVERAGE RATE OF 370 LBS. PER SQ. YD.

R1  5" WINDLIFTIC CONCRETE ISLAND (SURFACE MOUNTED) (SEE BID NO. 880.01)

R2  2" WINDLIFTIC CONCRETE ISLAND (KEYED IN) (SEE BID NO. 882.01)

R3  2'-6" CONCRETE CURB & GUTTER (SEE BID NO. 886.01)

T  COMPACTED EARTH MATERIAL

U  EXISTING PAVEMENT

V  WILDLING

NOTES: ALL PAVEMENT SLOPES ARE 1:1 UNLESS OTHERWISE SPECIFIED. CONTRACTOR MUST SURVEY THE EXISTING EDGE OF PAVEMENT IN WIDENING AREAS.

KEYED IN ISLAND

PROPOSED CONCRETE ISLAND LOCATIONS

SURFACE MOUNTED ISLAND

PROPOSED CONCRETE ISLAND LOCATIONS

DETAIL 1 - NARROW WIDENING WITH CURB & GUTTER USE IN CONJUNCTION WITH TYPICAL SECTIONS WHEN WIDENING AND C&G IS NEEDED

TYPICAL SECTION NO. 1

- Y1- STA. 10 + 66.00 TO STA. 12 + 00.00

TYPICAL SECTION NO. 2

- Y1- STA. 12 + 00.00 TO STA. 17 + 37.67 INSERT 1 RT

- Y1- STA. 21 + 75.00 TO STA. 25 + 94.00 INSERT 1 LT

TYPICAL SECTION NO. 3

- Y1- STA. 16 + 33.31 TO STA. 19 + 85.00

TYPICAL SECTION NO. 4

- Y1- STA. 20 + 75.00 TO STA. 24 + 73.25

TYPICAL SECTION NO. 5

- Y1- STA. 24 + 73.25 TO STA. 28 + 00.00
ELEVATION OF PROPOSED PEDESTRIAN HANDRAIL

PLAN VIEW

NOTES:
- CONSTRUCT PROPOSED STEEL PIPE RAIL OF 15" DIAMETER
- SCHEDULE 40 PLAIN END GALVANIZED STEEL PIPE IN ACCORDANCE WITH THE REQUIREMENTS OF ANSI A36.
- REPAIR GALVANIZING IN ACCORDANCE WITH SECTION 1078 OF THE HOSE STANDARD SPECIFICATIONS.
- PAINT, IF REQUISITE BY THE ENGINEER, IN ACCORDANCE WITH SECTION 1060 OF THE STANDARD SPECIFICATIONS.
- WELD IN ACCORDANCE WITH ARTICLE 1072-20 OF THE STANDARD SPECIFICATIONS.
RETAINING WALL ENVELOPE

THE WALL ENVELOPE DOES NOT ACCURATELY DEPICT THE ACTUAL FACE OF THE WALL.

BEGIN RETAINING WALL RT.
RW - STA. 10 + 00.00 =
L - STA. 12 + 41.41
EL = 616.02

END RETAINING WALL RT.
RW - STA. 11 + 98.91 =
L - STA. 14 + 35.00
EL = 615.70

TOP OF WALL
EXISTING GROUND
BOTTOM OF WALL
Note: Invert Elevations indicated are for Bid Purposes only and shall not be used for project construction stakeout.

See "Standard Specifications For Roads and Structures, Section 300-6".

### LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & UNDER)

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<th>PIPE SIZE</th>
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## STATE OF NORTH CAROLINA

### DIVISION OF HIGHWAYS

### SUMMARY OF EARTHWORK

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### SUMMARY OF EXISTING ASPHALT PAVEMENT REMOVAL

### GUARDRAIL SUMMARY

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**Additional Guard Rails**

- CAT-1: 2 @ 52.5' 102.60
- CAT-2: 4 @ 62.5' 250.00

**SAV:** 575.3

Approximate quantities only. Unclassified excavation, borrow excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the lump sum price for "Grading".
IMPROVEMENTS TO INTERSECTION OF US 29/601 AND SR 1394 (POPLAR TENT RD./MCGILL RD)

PROJECT C-4918A

BEGIN PROJECT

END PROJECT

VICINITY MAP

INDEX OF SHEETS

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>TITLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>TMP-1</td>
<td>TITLE SHEET AND INDEX OF SHEETS</td>
</tr>
<tr>
<td>TMP-1A</td>
<td>LEGEND, ROADSIDE STANDARD DRAWINGS</td>
</tr>
<tr>
<td>TMP-2</td>
<td>GENERAL NOTES</td>
</tr>
<tr>
<td>TMP-3</td>
<td>TRAFFIC CONTROL PHASING</td>
</tr>
<tr>
<td>TMP-4</td>
<td>WORK ZONE ADVANCE WARNING SIGNS</td>
</tr>
<tr>
<td>TMP-5</td>
<td>PHASE I - POPLAR TENT RD./MCGILL AVE.</td>
</tr>
<tr>
<td>TMP-5A</td>
<td>PHASE I - US 29</td>
</tr>
<tr>
<td>TMP-6</td>
<td>PHASE II - POPLAR TENT RD./MCGILL AVE.</td>
</tr>
<tr>
<td>TMP-6A</td>
<td>PHASE II - US 29</td>
</tr>
<tr>
<td>TMP-7</td>
<td>PHASE III - POPLAR TENT RD./MCGILL AVE.</td>
</tr>
<tr>
<td>TMP-7A</td>
<td>PHASE III - US 29</td>
</tr>
</tbody>
</table>

TRAFFIC MANAGEMENT STRATEGY

PROPOSED CONSTRUCTION WILL BE PERFORMED USING TIME RESTRICTED LANE CLOSURES. REFER TO SHEET TMP-3 FOR TRAFFIC CONTROL PHASING.

PLAN PREPARED FOR CITY OF CONCORD, NC

WORK ZONE SAFETY & MOBILITY

PLAN PREPARED BY:
Stantec Consulting Services Inc.

APPROVED:

BETSY L. WATSON, P.E.
TRAFFIC ENGINEER

GEORGE KARAGEORGIO
TRANSPORTATION DIRECTOR

DATE:
March 5, 2014
ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

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<tr>
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<tr>
<td>1101.02</td>
<td>TEMPORARY LANE CLOSURES</td>
</tr>
<tr>
<td>1101.04</td>
<td>TEMPORARY SHOULDER CLOSURES</td>
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<tr>
<td>1101.11</td>
<td>TRAFFIC CONTROL DESIGN TABLES</td>
</tr>
<tr>
<td>1110.01</td>
<td>STATIONARY WORK ZONE SIGNS</td>
</tr>
<tr>
<td>1110.02</td>
<td>PORTABLE WORK ZONE SIGNS</td>
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<tr>
<td>1115.01</td>
<td>FLASHING ARROW BOARD</td>
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<tr>
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<td>DRUMS</td>
</tr>
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<td>WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION</td>
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<td>1180.01</td>
<td>SKINNY - DRUM</td>
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<tr>
<td>1205.01</td>
<td>PAVEMENT MARKINGS - LINE TYPES AND OFFSETS</td>
</tr>
<tr>
<td>1205.02</td>
<td>PAVEMENT MARKINGS - TWO LANE AND MULTILANE ROADWAYS</td>
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<td>PAVEMENT MARKINGS - INTERSECTIONS</td>
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LEGEND

- EXIST. PVMT.
- PROPOSED PVMT.
- DIRECTION OF TRAFFIC FLOW
- DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- WORK AREA
- PAVEMENT REMOVAL
- TEMPORARY PAVEMENT

- TYPE III BARRICADE
  - CONE
  - DRUM
  - SKINNY DRUM
  - TUBULAR MARKER

- CHANGABLE MESSAGE SIGN (CMS)
- FLAGGER
- AUTOMATED FLAGGER ASSISTANCE DEVICE (AFAD)
- FLASHING ARROW BOARD (TYPE C)
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- WORK ZONE SIGN-PORTABLE
- WORK ZONE SIGN-STATIONARY
- WORK ZONE SIGN-STATIONARY OR PORTABLE

- TEMPORARY SHORING
- PORTABLE CONCRETE BARRIER (PCB)

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- DOUBLE YELLOW CENTER LINE
- SKIP LINES
- MINI-SKIP LINES
- SOLID LINES
- EXISTING PAVEMENT MARKING (GRAY)

PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS
- PAVEMENT MARKING SYMBOLS
- EXISTING PAVEMENT MARKING SYMBOLS (HOLLOW)
- PAVEMENT MARKING ALPHANUMERIC CHARACTERS

ROADWAY STANDARD DRAWINGS & LEGEND
GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADSIDE DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR DESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE CLOSURE TIME RESTRICTIONS
A) DO NOT CLOSE OR NARROW TRAVEL LANES AS FOLLOWS:

ROAD NAME          | DAY AND TIME RESTRICTIONS
-------------------|-------------------------
US 29 POPPLAR TENT NO. | 6:00 A.M.-9:00 P.M. MONDAY THRU FRIDAY
WOGILL AVE.        |

HOLIDAY & HOLIDAY WEEKEND LANE CLOSURE TIME RESTRICTIONS
B) DO NOT CLOSE OR NARROW TRAVEL LANES DURING HOLIDAYS AND HOLIDAY WEEKEND AS FOLLOWS:

ROAD NAME          | ALL ROADS
-------------------|----------------------------------
1) FOR ANY UNEXPECTED OCCURRENCE THAT CREATES UNUSUALLY HIGH TRAFFIC VOLUMES, AS DIRECTED BY THE ENGINEER.
2) FOR NEW YEAR’S, BETWEEN THE HOURS OF 6:00 A.M. DECEMBER 31ST TO 9:00 A.M. JANUARY 1ST. IF NEW YEAR'S DAY IS ON A FRIDAY, SATURDAY, SUNDAY, OR MONDAY THEN UNTIL 9:00 P.M. THE FOLLOWING TUESDAY.
3) FOR EASTER, BETWEEN THE HOURS OF 6:00 A.M. THURSDAY AND 9:00 P.M. MONDAY.
4) FOR MEMORIAL DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY TO 9:00 P.M. TUESDAY.
5) FOR INDEPENDENCE DAY, BETWEEN THE HOURS OF 6:00 A.M. THE DAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE DAY AFTER INDEPENDENCE DAY. IF INDEPENDENCE DAY IS ON A FRIDAY, SATURDAY, SUNDAY OR MONDAY THEN BETWEEN THE HOURS OF 6:00 A.M. THE THURSDAY BEFORE INDEPENDENCE DAY AND 9:00 P.M. THE TUESDAY AFTER INDEPENDENCE DAY.
6) FOR LABOR DAY, BETWEEN THE HOURS OF 6:00 A.M. FRIDAY AND 9:00 P.M. TUESDAY.
7) FOR THANKSGIVING, BETWEEN THE HOURS OF 6:00 A.M. TUESDAY TO 9:00 P.M. MONDAY.
8) FOR CHRISTMAS, BETWEEN THE HOURS OF 6:00 A.M. THE FRIDAY BEFORE THE WEEK OF CHRISTMAS DAY AND 9:00 P.M. THE FOLLOWING TUESDAY AFTER THE WEEK OF CHRISTMAS.

LANE AND SHOULDER CLOSURE REQUIREMENTS
C) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.
D) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING WITHIN 15 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN SHOULDER USING ROADSIDE STANDARD OUTLINE NO. 1101-04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.
E) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON THE SHOULDER ADJACENT TO AN UNDIVIDED FACILITY AND WITHIN 5 FT OF AN OPEN TRAVEL LANE, CLOSE THE NEAREST OPEN TRAVEL LANE UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL.
F) WHEN PERSONNEL AND/OR EQUIPMENT ARE WORKING ON A LANE OF TRAVEL OF AN UNDIVIDED OR DIVIDED FACILITY, CLOSE THE LANE ACCORDING TO THE TRANSPORTATION MANAGEMENT PLAN, ROADSIDE STANDARD OUTLINE NO. 1101-04 UNLESS THE WORK AREA IS PROTECTED BY BARRIER OR GUARDRAIL OR A LANE CLOSURE IS INSTALLED.

PAVEMENT EDGE DROP-OFF REQUIREMENTS
G) BACKFILL AT A 6:1 SLOPE UP TO THE EDGE AND ELEVATION OF EXISTING PAVEMENT IN AREAS ADJACENT TO AN OPENED TRAVEL LANE THAT HAVE AN EDGE OF PAVEMENT DROP-OFF AS FOLLOWS:
BACKFILL DROP-OFFS THAT EXCEED 2 INCHES ON ROADS WITH POSTED SPEED LIMITS OF 45 MPH OR GREATER.
BACKFILL DROP-OFFS THAT EXCEED 3 INCHES ON ROADS WITH POSTED SPEED LIMITS LESS THAN 45 MPH.
BACKFILL WITH SUITABLE COMPACTED MATERIAL, AS APPROVED BY THE ENGINEER, AT NO ADDITIONAL EXPENSE.

PROPOSED AND EXISTING SIGNING
H) MAINTAIN ALL EXISTING SIGNING ON PROJECT (WARNING, REGULATORY AND GUIDE SIGNS). WHERE CONSTRUCTION AFFECTS THE LOCATION OF A SIGN, RELOCATE AS NECESSARY, OR INSTALL A REPLACEMENT SUCH THAT THE FUNCTION OF THE SIGN IS MAINTAINED AT ALL TIMES.
I) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.
J) COVER SIGNS OR PORTIONS OF SIGNS THAT HAVE BEEN ERECTED, BUT THAT ARE NOT YET APPLICABLE TO TRAFFIC.

PAVEMENT MARKINGS AND MARKERS
K) INITIALLY, USE PAINT FOR INTERIM MARKINGS AS NEW TURN LINES AND NEW PATTERNS ARE OPEN TO TRAFFIC. PLACE INTERIM MARKINGS IN THE SAME MANOR AS THE FINAL MARKING SHOWN IN THE PAVEMENT MARKING PLAN. FINAL MARKINGS ARE TO BE PLACED UPON COMPLETION OF ALL OTHER OPERATIONS AS DIRECTED BY THE ENGINEER.
L) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
M) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS BEFORE OPENING LANES/ROADS TO TRAFFIC.

MISCELLANEOUS
N) USE LAW ENFORCEMENT TO MAINTAIN TRAFFIC THROUGH THE WORK AREA AND/OR INTERSECTIONS, AS DIRECTED BY THE ENGINEER.
O) MAINTAIN SIDEWALK ACCESS AT ALL TIMES.
P) ALL DIMENSIONS AND STATIONS IN THE TRAFFIC MANAGEMENT PLAN AND PHASING ARE APPROXIMATE (+/-); FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
Q) ENSURE THE OVERSIZE/OVERWEIGHT PERMIT UNIT (919) 733-4740 HAS BEEN ADVISED OF THE ONGOING TRAFFIC OPERATIONS THROUGH THE DIVISION OFFICE.

Stantec Consulting Services Inc.
211 Jones Fratelio Road
Suite 300
Elmira, NY 14904
Tel: (607) 734-3300
Fax: (607) 734-3310
www.stantec.com
license No. 0-5213

GENERAL NOTES
TRAFFIC CONTROL PHASING

Prior to any construction operations install work zone advance warning signs on project as shown on sheet TMP-4.

Phase I

Using lane closures construct the following as shown on sheets TMP-5, 5A:

- Construct all U-turn bulb pavement along us 29 and McGill Ave. and maintain closed using drums.
- Construct outside widening/curb/driveway work along us 29, and Poplar tent Rd.
- Construct median, guardrail and concrete islands on US 29 FROM L STA. 21+50 - 25+04 AND MAINTAIN CLOSED USING DRUMS AND BARRICADES. INCLUDE CONSTRUCTION OF NEW SIGNAL TO BE ACTIVATED IN PHASE III.
- Begin installation of proposed signing. Cover signs or portions of signs that have been erected, but that are not yet applicable to traffic.

Phase II

Using lane closures construct the following as shown on sheets TMP-6, 6A:

- Construct median and concrete islands on US 29 FROM L STA. 10+08 - 16+25 AND MAINTAIN CLOSED USING DRUMS AND BARRICADES. INCLUDE CONSTRUCTION OF NEW SIGNAL TO BE ACTIVATED IN PHASE III.
- Construct concrete islands on McGill Ave. FROM Y1 STA. 23+00 - 27+03. Coordinate construction with concrete plant, in order to conduct operations as much as possible during periods when concrete plant is not in operation. Include construction of new signal to be activated in Phase III.

Phase III

Step 1: (TMP-7, 7A)

In one continuous work period, revise the traffic pattern for US 29, Poplar Tent Rd., and McGill Ave. to the new pattern shown on sheets TMP-7, 7A as follows:

- Install interim paint pavement markings for the new pattern. Markings are in the same location as final markings shown in the pavement markings plan. Use paint for interim markings until final markings are installed in Step 4.
- Activate all previously constructed new signals at the three U-turn bulbs as shown on sheets TMP-7, 7A.
- Implement (uncover) proposed signing.
- Close all four existing left turn lanes at the intersection of US 29 and Poplar Rd./McGill Ave.
- Open new U-turn bulbs and associated U-turn lanes to the new traffic pattern.

Step 2: (TMP-7, 7A)

Using lane closures construct the following as shown on sheets TMP-7, 7A:

- Remove existing concrete island, construct remainder of drainage and new concrete island on US 29 FROM L STA. 16+25 - 17+30 AND MAINTAIN CLOSED USING DRUMS.
- Construct remainder of drainage and concrete island on McGill Ave. FROM Y1 STA. 20+75 - 23+00. Include construction of new signal to be activated in Step 3.
- Construct remainder of drainage and concrete island on Poplar Tent Rd. FROM Y1 STA. 18+40 - 19+65. Include construction of new signal to be activated in Step 3.

Step 3:

In one continuous work period activate the new signal at the intersection of US 29/Poplar Tent Rd. That was constructed in Step 2.

Step 4:

Upon completion of all construction operations place final pavement markings and markers as shown in the pavement marking plan.
BEGIN CMWG PROJECT C-491BA STA.10+00 (L-1)

BEGIN CONSTRUCTION
STA.15+50 (Y1-1)

500'

END CMWG PROJECT C-491BA
STA.20+61 (L-1)

US 29 (CONCORD PKWY) NBL

US 29 (CONCORD PKWY) SBL

NOTE:
INSTALL WORK ZONE ADVANCE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.

END CONSTRUCTION
STA.26+50 (Y1-1)

WORK ZONE
ADVANCE WARNING SIGNS
STATE OF NORTH CAROLINA
CITY OF CONCORD

PAVEMENT MARKING PLAN
CABARRUS COUNTY

INDEX

PMP-1 PAVEMENT MARKING PLAN COVER SHEET
PMP-2 PAVEMENT MARKING SCHEDULE
PMP 3-7 PAVEMENT MARKING DETAIL

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

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<td>PAVEMENT MARKINGS - LINE TYPES &amp; OFFSETS</td>
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<td>PAVEMENT MARKINGS - 2 LANE &amp; MULTILANE ROADWAYS</td>
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<td>PAVEMENT MARKINGS - TURN LINES</td>
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<td>1205.06</td>
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<td>PAVEMENT MARKINGS - SYMBOLS &amp; WORD MESSAGES</td>
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<td>PAVEMENT MARKINGS - PAINTED ISLANDS</td>
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<td>PAVEMENT MARKINGS - BRIDGES</td>
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<td>PAVEMENT MARKER SPACING</td>
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<td>SHOPLIFTABLE RAISED PAVEMENT MARKERS</td>
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GENERAL NOTES

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT, EXCEPT WHERE OTHERWISE NOTED IN THE PLAN, OR DIRECTED BY THE ENGINEER.

A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

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<th>MARKING</th>
<th>MARKER</th>
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B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.

D) STOP BAR LOCATION AT NON-SIGNALIZED INTERSECTIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER.

E) MARKERS SHALL BE INSTALLED ACCORDING TO THE NC DOT ROADWAY STANDARD DRAWING 1250.01.

PLAN PREPARED BY:

BETSY L. WATSON, P.E. TRAFFIC ENGINEER

GEORGE KARA GEORGE TRANSPORTATION DESIGNER
FINAL PAVEMENT MARKING SCHEDULE

SYMBOL DESCRIPTION

- T2 WHITE STOPBAR THERMOPLASTIC 24"
- T3 3FT-9FT./SP WHITE MINISKIP THERMOPLASTIC 4" 120 MILS
- T5 WHITE SOLID LANE LINE THERMOPLASTIC 4" 120 MILS
- T7 YELLOW DOUBLE CENTER THERMOPLASTIC 4" 120 MILS
- T8 2FT-6FT./SP WHITE MINISKIP THERMOPLASTIC 4" 120 MILS
- T9 WHITE EDGELINE THERMOPLASTIC 4" 90 MILS
- TB YELLOW EDGELINE THERMOPLASTIC 4" 90 MILS
- TD WHITE GORELINE THERMOPLASTIC 12" 90 MILS
- TF WHITE DIAGONAL THERMOPLASTIC 12" 90 MILS
- TV YELLOW DIAGONAL THERMOPLASTIC 8" 90 MILS
- ME YELLOW & YELLOW SNOWPLOWABLE RAISED PAVEMENT MARKER
- MF CRYSTAL & RED SNOWPLOWABLE RAISED PAVEMENT MARKER

THERMOPLASTIC PAVEMENT MARKING SYMBOL & CHARACTER LEGEND

- UA LEFT TURN ARROW SYMBOL (90 MILS)
- UB RIGHT TURN ARROW SYMBOL (90 MILS)
- UC STRAIGHT ARROW SYMBOL (90 MILS)
- UE STRAIGHT/RIGHT ARROW SYMBOL (90 MILS)
- UT ALPHANUMERIC CHARACTERS (120 MILS)
- UT U-TURN ARROW (90 MILS)
CITY OF CONCORD

SIGNING PLAN

CABARRUS COUNTY

LOCATION: US 29/SUS 601 FROM SOUTH OF SR 1394 (POPLAR TENT ROAD) AND MCGILL ROAD TO NORTH OF SR 1394 (POPLAR TENT ROAD) AND MCGILL ROAD

ROADWAY STANDARD DRAWINGS

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STD. NO. TITLE
901.50 ARROWS AND SHIELDS
904.10 ORIENTATION OF GROUND MOUNTED SIGNS
904.50 MOUNTING OF TYPE 'D', 'E' AND 'F' SIGNS ON 'U' CHANNEL POSTS

GENERAL NOTES

SIGN FURNISHED BY CONTRACTOR

IF REMOVAL OR RELOCATION OF SIGNS ON PRIVATE STREET (NON-STATE MAINTAINED) IS REQUIRED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL INFORM THE ENGINEER. THE WORK WILL BE COMPLETED BY OTHERS.

SIGNING PLANS DO NOT INCLUDE TEMPORARY CONSTRUCTION SIGNING.

SEE TRAFFIC CONTROL PLANS.

WHEN NOT STATED OR DIMENSIONED ON PLANS, ALL 'E' AND 'F' SIGNS SHALL BE FIELD LOCATED BY THE ENGINEER.

ALL EXISTING SIGNS ON 'U' CHANNEL POSTS WITHIN THE PROJECT LIMITS SHALL BE REMOVED AND DISPOSED OF UNLESS OTHERWISE NOTED ON PLANS.

WHEN EXISTING SIGNS ARE REMOVED AND INSTALLED ON NEW SUPPORTS, THE RE-EJECTION SHALL IMMEDIATELY FOLLOW THE REMOVAL.

THE BACKGROUND FOR TYPE E & F SIGNS SHALL BE TYPE C REFLECTIVE SHEETING.

SEE ROADWAY PLANS FOR GUARD/GUIDE RAIL DETAILS.

SUMMARY OF QUANTITIES

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>ITEM DESCRIPTION</th>
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PROJECT: POPLAR TENT ROAD

PLAN PREPARED BY:

BETSY L. WATSON, P.E.  TRAFFIC ENGINEER

ROSI R. HENNEIN  TRANSPORTATION TECHNICIAN

INDEX

<table>
<thead>
<tr>
<th>SHEET NO.</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIGN-1</td>
<td>TITLE SHEET</td>
</tr>
<tr>
<td>SIGN-2</td>
<td>SIGN DESIGNS</td>
</tr>
<tr>
<td>SIGN-3</td>
<td>TYPE 'D' SIGN</td>
</tr>
<tr>
<td>SIGN-3A</td>
<td>TYPE 'E' SIGN</td>
</tr>
<tr>
<td>SIGN-4-B</td>
<td>SIGN DETAIL SHEETS</td>
</tr>
<tr>
<td>Quantity Req'd</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>-------------</td>
</tr>
<tr>
<td>405</td>
<td>Speed Limit 45</td>
</tr>
<tr>
<td>406</td>
<td>Stop</td>
</tr>
<tr>
<td>411</td>
<td>Traffic Light</td>
</tr>
<tr>
<td>402</td>
<td>Antenna</td>
</tr>
<tr>
<td>407</td>
<td>Arrow Up</td>
</tr>
<tr>
<td>412</td>
<td>Arrow Right</td>
</tr>
<tr>
<td>403</td>
<td>One Way</td>
</tr>
<tr>
<td>408</td>
<td>One Way</td>
</tr>
<tr>
<td>413</td>
<td>One Way</td>
</tr>
<tr>
<td>404</td>
<td>Right Lane Must Turn Right</td>
</tr>
<tr>
<td>410</td>
<td>Speed Limit 35</td>
</tr>
<tr>
<td>409</td>
<td>One Way</td>
</tr>
<tr>
<td>415</td>
<td>Do Not Enter</td>
</tr>
</tbody>
</table>

**Type 'E' Signs**
PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, RELocate SIGN TYPE F
3. DISPOSAL OF SUPPORT, U-CHANNEL
4. DISPOSAL OF SIGN, D, E, OR F

EXISTING & PROPOSED SIGNING
-L STA. 4+00 TO 13+87
US 29/CONCORD PKWY
PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, RELOCATE SIGN TYPE F
3. DISPOSAL OF SUPPORT, U-CHANNEL
4. DISPOSAL OF SIGN, D, E, OR F

EXISTING & PROPOSED SIGNING
-L- STA. 23+61 TO 34+28
US 29/CONCORD PKWY
PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, RELOCATE SIGN TYPE F
3. DISPOSAL OF SUPPORT, U-CHANNEL
4. DISPOSAL OF SIGN, D, E, OR F

EXISTING & PROPOSED SIGNING
-Y- STA. 12+00 TO 17+60
SR 1304/POPLAR TENT RD
PROJECT NOTES

1. DISPOSAL OF SIGN SYSTEM, U-CHANNEL
2. SIGN ERECTION, RELOCATE SIGN TYPE F
3. DISPOSAL OF SUPPORT, U-CHANNEL
4. DISPOSAL OF SIGN, D, E, OR F

EXISTING & PROPOSED SIGNING
-Y- STA. 22+55 TO 30+60
McGILL AVE
# Soil Stabilization Summary Sheet

## Matting for Erosion Control

<table>
<thead>
<tr>
<th>CONST SHEET NO.</th>
<th>LINE</th>
<th>FROM STATION</th>
<th>TO STATION</th>
<th>SIDE</th>
<th>ESTIMATE (SY)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTIRE PROJECT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>150</td>
</tr>
<tr>
<td>TOKEN QUANTITY</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**SUBTOTAL**

**Miscellaneous Matting to be Installed as Directed by the Engineer**

| TOTAL |      |              |            |        | 150           |
| SAW   |      |              |            |        | 150           |

## Matting for Erosion Control

<table>
<thead>
<tr>
<th>CONST SHEET NO.</th>
<th>LINE</th>
<th>FROM STATION</th>
<th>TO STATION</th>
<th>SIDE</th>
<th>ESTIMATE (SY)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## SOIL STABILIZATION TIMEFRAMES

<table>
<thead>
<tr>
<th>SITE DESCRIPTION</th>
<th>STABILIZATION TIME</th>
<th>TIMEFRAME EXCEPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perimeter Dikes, Swales, Ditches and Slopes</td>
<td>7 Days</td>
<td>None</td>
</tr>
<tr>
<td>High Quality Water (H qw) Zones</td>
<td>7 Days</td>
<td>None</td>
</tr>
<tr>
<td>Slopes Steeper than 3:1</td>
<td>7 Days</td>
<td>If slopes are 10' or less in length and are not steeper than 2:1, 14 days are allowed.</td>
</tr>
<tr>
<td>Slopes 3:1 or Flatter</td>
<td>14 Days</td>
<td>7 Days for slopes greater than 50' in length.</td>
</tr>
<tr>
<td>All other areas with slopes flatter than 4:1</td>
<td>14 Days</td>
<td>None, except for perimeters and HQW zones.</td>
</tr>
</tbody>
</table>
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

LOCATION: US 29-US 601 FROM JUST NORTH OF SR 1394
POPLAR TENT ROAD AND MCGILL AVE TO
JUST SOUTH OF SR 1394 POPLAR TENT ROAD
AND MCGILL AVE

TYPE OF WORK: TRAFFIC SIGNALS, METAL POLES,
AND COMMUNICATIONS CABLE

VICTORY MAP

10-2105
10-0446

10-2104

US 29-US 601
(CONCORD PARKWAY)

MATCHLINE BELOW

C-9503
C-9515

MATCHLINE ABOVE

SIG. 1
SIG. 2-3
SIG. 4-5
SIG. 6-7
SIG. 8-9
SIG. 10-12
SIG. 13-20

INDEX OF PLANS

SIGNAL INVENTORY NUMBER

LOCATION DESCRIPTION

US 29-US 601 CONCORD PARKWAY AT POPLAR TENT RD/MCGILL AVE SOUTH U-TURN
US 29 (CONCORD PARKWAY) AT SR 1394 POPLAR TENT ROAD/MCGILL AVENUE
US 29 (CONCORD PARKWAY) AT POPLAR TENT RD/MCGILL AVE NORTH U-TURN
MCGILL AVENUE AT US 29 (CONCORD PARKWAY) U-TURN
METAL POLE DETAILS
METAL POLE STANDARDS
COMMUNICATIONS CABLE PLANS

LEGEND

NCDOT CONTACTS:
Transportation Mobility and Safety Branch
Enoch J. Williams, P.E. - Western Region Signals Engineer
Zachary A. Little, PE - Signals Project Engineer
J. Neil Avery - Signal Communications Project Engineer

STANTEC CONTACTS:
Betty L. Watson, P.E. - Transportation Engineer
Dean Harris - Special Transportation Designer
Sam L. Williams, P.E. - Transportation Designer

Prepared For the Office of:

Stantec Consulting Services Inc.
881 Jones Franklin Road
Suite 300
Raleigh, NC 27605
Tel: (919) 851-6890
Fax: (919) 851-7124
www.stantec.com
License No. F-8472
NOTES:
1. Card is provided with all double jumpers in place. Removal of any jumper allows channel to run concurrently.
2. Ensure jumpers SN-140 and SJ-220 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Connect serial cable from conflict monitor to open, part 1 of 2070 controller. Ensure controller operates with 2070.

INPUT FILE POSITION LAYOUT

FILE

INPUT FILE CONNECTION & PROGRAMMING CHART

TYPICAL OPTIC CABLE WIRE DETAIL

FIELD CABINET

EDF MODEL 2018ECN-NC CONFLICT MONITOR

PROGRAMMING DETAIL

RETAIN ALL DOOLO JUMPER.

NOTES:
1. To prevent "flash-conflict" problems, insert red flash program block for all unused vertical load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 2 for Variable Initial and Gap Reduction.
4. Program phase 2 for Start Up in Green.
5. Program phase 2 for Yellow Flash.
6. The cabinet and controller are part of the City of Concord Central System.

EQUIPMENT INFORMATION

CONTROLLER: 2070L
CABINET: 752L
SOFTWARE: ECONOLITE OASIS
CABINET MOUNT: BASE
OUTPUT FILE POSITIONS: 1-12
LOAD SWITCHES USED: 52-510
PHASES USED: 2-1
OVERLAPS: NONE

EMERGENCY PREEMPTION PROGRAMMING DETAIL

PROGRAM controller as shown below:
From Main Menu, press "A" (Preempt), then "1" (Standard Preempt). Press "NEXT" as needed to advance to Preempt 3.

SERVICE PREEMPT

PROGRAM controller as shown below:
Press "NEXT" to advance to Preempt 3.

INPUT FILE POSITION LEGEND

FILE 2 SLOT 2

REVISIONS:

TYPICAL OPTIC CABLE WIRE DETAIL

FIELD CABINET

US 29-801 (CONCORD PARKWAY) POPULAR TENT RD/AVOILL AVE SOUTH U-TURN

ELECTRICAL DETAIL - NEW INSTALLATION

PREPARED FOR STANCET

PROJECT SHEET 8/22/01

DATE: 01-28-01

STANTECT CONSULTING SERVICES INC.
900 JAMES FRANKLIN ROAD SUITE 200
PENNSYLVANIA 15228
PHONE 724-941-7050/7051
FAX 724-941-7054
WEBSITE: STANTECT.COM
LICENSED TO N.C. No. 7-0072

STANTECT CONSULTING SERVICES INC.
900 JAMES FRANKLIN ROAD SUITE 200
PENNSYLVANIA 15228
PHONE 724-941-7050/7051
FAX 724-941-7054
WEBSITE: STANTECT.COM
LICENSED TO N.C. No. 7-0072

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN 18-2285
DESIGNED FEBRUARY 1995
SEAL 4/15 REVISED

TYPICAL OPTIC CABLE WIRE DETAIL

FIELD CABINET

J10 1

Orange

Blue

White

Channel

Input (100k)

Input (1000 k)

1000 k

100 k

Yellow

Cable

wire pair with insulating tape

EG Wire

SNAKE POSITION OF SWITCH
**ED1 MODEL 2018CL NC CONFLICT MONITOR**

**PROGRAMMING DETAIL**

- Remove diode jumpers 2-4 and 4-8.

**NOTES**

1. Card is provided with six diode jumpers in place. Removal of any diode allows its channel to run concurrently.
2. Ensure jumpers SEL-14 and SEL-30 are present on the monitor board.
3. Ensure that red enable is active at all times during normal operation.

**INPUT FILE POSITION LAYOUT**

<table>
<thead>
<tr>
<th>FILE PRICE 1</th>
<th>FILE PRICE 2</th>
<th>FILE PRICE 3</th>
<th>FILE PRICE 4</th>
<th>FILE PRICE 5</th>
<th>FILE PRICE 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
<td>11</td>
<td>12</td>
</tr>
</tbody>
</table>

**SPECIAL DETECTOR NOTE**

- Install and program device on the basis of manufacturer's instructions, including manufacturer's recommended mounting locations to accomplish the detection scheme shown on the Signal Design Plans.

**INPUT FILE CONNECTION & PROGRAMMING CHART**

**NORMAL OPTION FIELD WIRE DETAIL**

<table>
<thead>
<tr>
<th>TYPICAL OPTION FIELD WIRE DETAIL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Channel A: 1</td>
</tr>
<tr>
<td>Channel C: 3</td>
</tr>
<tr>
<td>Channel E: 5</td>
</tr>
</tbody>
</table>

**PROGRAMMING COMPLETE**

Program extend time on optical detector unit for 30 minutes.
NOTES:

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL1-SEL5 and SEL9 are present on the monitor boards.
3. Ensure that red LED is active at all times during normal operation.

INPUT FILE POSITION LAYOUT (Four cases)

INPUT FILE CONNECTION & PROGRAMMING CHART

CONTROLER: 2070L
CABINET: 332
SOFTWARE: ECSOILITE OASIS
CABINET MOUNT: .BASE
OUTPUT FILE POSITIONS: 12
LOAD SWITCHES USED: 54.5B
OVERLAPS: 5.6

EX.: 1A, 2A, ETC. = LOOP NO/5
FS = FLASH SENSE
S7 = STOP TIME

EQUIPMENT INFORMATION

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN 00828
DESIGNED: FEBRUARY 2005
STANTEC REV: 003

ELECTRICAL DETAIL - NEW INSTALLATION

US 29 (CONCORD PARKWAY)
AT
POPLAR TENT RD/MEGILL AVE
NORTH U-TURN

SEAL

Stantec Consulting Services Inc.
281 Jones Prince Road Suite 300
Raleigh N.C. 27608
Fax: (919) 851-1704
www.stantec.com
License No. T-08712

[Diagram of circuit connections and programming details]
**NOTES**

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all phases.
3. Program phase 6 for Variable Initial and Gap Reduction.
4. Program phase 6 for Start Up In Green.
5. Program phase 6 for Yellow Flash.
6. The cabinet and controller are part of the City of Concord Central System.

**INPUT FILE POSITION LAYOUT**

<table>
<thead>
<tr>
<th>FILE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>I</th>
<th>J</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTE: Card is provided with all solder jumprers in place. Removal of any jumper allows its channels to run concurrently.

**INPUT FILE CONNECTION & PROGRAMMING CHART**

**EQUIPMENT INFORMATION**

- CONTROLLER: ZOTO
- CABINET: CONSOLITE OASIS
- SOFTWARE: CONSOLITE OASIS
- CABINET MOUNT: BASE
- OUTPUT FILE POSITIONS: 12
- LOAD SWITCHES USED: 54, 56
- PHASES USED: 3-6
- OVERLAPS: NONE

**SIGNAL HEAD HOOK-UP CHART**

**INPUT FILE POSITION LEGEND**

- FS = Flash Sense
- ST = Stop Time

**ELECTRICAL DETAIL - NEW INSTALLATION**

Stantec Consulting Services Inc.
5511 Exploration Road, Suite 300
Raleigh, NC 27606
Telephone: 919-578-7345
Fax: 919-578-7345
E-mail: info@stantec.com
Website: www.stantec.com
License No. P-8772

McGill Avenue
US 29 (Concord Parkway) U-Turn

Prepared By: F. Wiltin
Prepared On: February 2015
Drawn By: J. Shuler
Drawn On: 2/19/15
Redrawn By: W. Anderson
Redrawn On: 3/11/15
Revised: 6/15

Stantec Consulting Services Inc.
5511 Exploration Road, Suite 300
Raleigh, NC 27606
Telephone: 919-578-7345
Fax: 919-578-7345
E-mail: info@stantec.com
Website: www.stantec.com
License No. P-8772

This electrical detail is for the segment Design C-1005
Designed: February 2015
Sealed: 6/15
Revised:
**SPECIAL NOTE**

The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

---

**MAST ARM LOADING SCHEDULE**

**Elevation Data for Mast Arm Attachment (H1)**

<table>
<thead>
<tr>
<th>Elevation Difference for:</th>
<th>Pole 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reference point at:</td>
<td>0.0 ft.</td>
</tr>
<tr>
<td>Foundation &amp; ground level</td>
<td></td>
</tr>
<tr>
<td>Elevation difference at:</td>
<td>0.0 ft.</td>
</tr>
<tr>
<td>High point of roadway surface</td>
<td></td>
</tr>
<tr>
<td>Elevation difference at:</td>
<td>0.2 ft.</td>
</tr>
<tr>
<td>Edge of travelway or rail of curb</td>
<td></td>
</tr>
</tbody>
</table>

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**NOTES**

1. Design the traffic signal structure and foundation in accordance with:
   - The NCHRP Report 450, "Recommended Specifications for Structural Supports of Highway Signs, Light Fixtures, and Traffic Signals, including all of the latest interim revisions.
   - The 2015 NCDOT Highway Standard Drawings.
   - The traffic signal support plans and special provisions.
   - The NCDOT "Mast Pole Standards" located at the following NCDOT website: https://www.ncdot.gov/resources/design/tds-design-resources.aspx

2. Design the traffic signal structure using the loading conditions shown in the elevation data and analysis. Add the 75 ft. lattice tower load as shown in the connection points. The maximum loads that will be applied at the time of the installation. The contractor should verify the installation.

3. Use all foundation support plans and special provisions that do not exceed 0.9.

4. A clamp type bolted mast arm-to-pole connection may be used instead of the welded ring reinforced box connection shown as long as the connection meets all of the design requirements.

5. The mast arm attachment height will be determined by the following design assumptions:
   - The mast arm attachment height will be determined by the following design assumptions:

6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   - 1:1 Horizontal to Vertical ratio and 25 ft. as measured from the centerline of the road, the centerline of the road, and the centerline of the road.

7. The mast arm attachment height (H1) shown is based on the following design assumptions:
   - The mast arm attachment height (H1) shown is based on the following design assumptions:

8. The mast arm attachment height (H1) shown is based on the following design assumptions:
   - The mast arm attachment height (H1) shown is based on the following design assumptions:

9. The mast arm attachment height (H1) shown is based on the following design assumptions:
   - The mast arm attachment height (H1) shown is based on the following design assumptions:

10. The contractor shall provide a detailed foundation and anchor bolt template for the mast arm attachment height (H1) shown is based on the following design assumptions.

---

**POLE RADIAL ORIENTATION**

**8 BOLT BASE PLATE DETAIL**

See Note 6

**BASE PLATE TEMPLATE & ANCHOR BOLT DETAIL**

For 8 Bolt Base Plate
**SPECIAL NOTE**

The contractor is responsible for verifying that the mast arm attachment height (HI) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

**Elevation Data for Mast Arm Attachment (HI)**

<table>
<thead>
<tr>
<th>Pole 2</th>
<th>Description</th>
<th>Area</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poles mounted signal head 12'-6&quot; section with backplate</td>
<td>0.5 ft.</td>
<td>26.5 ft.</td>
<td>37.1 lb.</td>
<td></td>
</tr>
<tr>
<td>Poles mounted signal head 12'-6&quot; section with backplate</td>
<td>0.5 ft.</td>
<td>26.5 ft.</td>
<td>37.1 lb.</td>
<td></td>
</tr>
</tbody>
</table>

**POLE RADIAL ORIENTATION**

านมพ์

**8 BOLT BASE PLATE DETAIL**

Base line reference elev. = 0.0'

**NCODT Wind Zone 4 (90 mph)**

US 29 (Concord Parkway) at Poplar Tent Rd/ McCall AVE NORTH U-TURN

METAL POLE DETAILS

1. The contractor is responsible for verifying that the mast arm attachment height (HI) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

2. Design the traffic signal structure using the loading conditions shown in the elevation view. The loads are applicable to one pole installation only and do not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.

3. Design all signal supports using stresses that do not exceed 0.8.

4. The contractor must ensure that the design meets all of the design requirements.

5. Design the pole base plates with 8 anchor bolts. Provide 2 inch C 60 grade anchor bolts.

6. The mast arm attachment height (HI) shown is based on the following design considerations:
   - Height is measured from the centerline of the pole base to the centerline of the pole.
   - The top of the pole base plate is 1.25 feet above ground elevation.
   - The pole base plate is 1.25 feet above ground elevation.
   - The pole base plate is 1.25 feet above ground elevation.
   - The pole base plate is 1.25 feet above ground elevation.

7. The pole manufacturer will determine the total height (HI) of each pole using the greater of:
   - Mast arm attachment height (HI) plus 2 feet, and
   - 5 feet above the centerline of the pole.

8. For pole location adjustments are required, the contractor must gain approval from the engineer so that any adjustments are maintained at the appropriate foundation level.

9. Contact the Stantec Design Section Structural Engineer at 704-348-7725.

10. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer on site specific foundations can be designed.
SPECIAL NOTE

The contractor is responsible for verifying that the mast arm attachment height (H) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

<table>
<thead>
<tr>
<th>Description</th>
<th>Area</th>
<th>Size</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pile Foundation 6 groud level</td>
<td>0.6</td>
<td>1.5m</td>
<td>1.5</td>
</tr>
<tr>
<td>Elevation difference at high point of roadway surface</td>
<td>-0.4</td>
<td>-0.4</td>
<td>-0.4</td>
</tr>
<tr>
<td>Edge of travelway or face of curb</td>
<td>-0.4</td>
<td>-0.4</td>
<td>-0.4</td>
</tr>
</tbody>
</table>

Design Reference Material

1. Design the traffic signal structure and foundation in accordance with:
   b. The DOT Design Manual for Roads and Bridges. The latest edition to this manual shall be used for the traffic signal project special provisions.
   c. The DOT NCDOT Standard Drawings.
   d. The NCDOT "Metal Pole Standards" located at the following NCDOT website:

Design Requirements

2. Design the traffic signal structure using the loading conditions shown in the elevation drawings. Assume and be consistent with "Design Loads" and may not be combined with actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plan for the actual loads that will be applied at the time of the installation.

3. Design all signal supports using stress ratios that do not exceed 0.9.
4. A clamp-type bolted mast arm-to-pole connection may be used instead of the washer ring
   connection shown as long as the connection meets all of the design requirements.
5. Maximum spacing of the mast arm to pole must be no greater than the maximum spacing shown in the data sheet.
6. The mast arm attachment height (H1) shown is based on the following design assumptions:
   a. A vertical rise to mast and is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
   b. Signals placed on the mast arm are rigid mounted and vertically centered on the pole.
   c. The installation of the mast arm at the elevation shown on the drawing.
   d. The top of the pole base plate is 5 feet above the grade elevation.
   e. Refer to the elevation data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
   f. Provide a horizontal distance from proposed centerline of foundation to edge of travelway.
5. The elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when driven piles are selected to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the proper design of the mast arm.
6. The pole manufacturer will determine the total height (H2) of each pole using the greater of:
   a. Mast arm attachment height (H1) plus 2 feet or
   b. 15 feet plus 1/2 of the total height of the mast arm attachment assembly plus 1 feet.
7. If pole location designs are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and mast arm attachment heights. For information contact the Signal Design Section Structural Engineer 919-773-0000.
8. The contractor is responsible for verifying that the mast arm attachment height will be properly positioned or the pole.
9. The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

MCNILL AVENUE

US 29 (CONCORD PARKWAY) U-TURN

METAL POLE DETAILS

BASE PLATE TEMPLATE & ANCHOR BOLT

For 8 Bolt Base Plate
Terminal Compartment Detail

1" X 1/4" Coarse-Thread Button
Head Socket Screw (4 Required)

Terminal Compartment, 3 Gauge,
2" X 8" X 27"

2" Half Coupling
with Internal Threads

2" Dia. Hole in Pole Wall for
Wire Entrance

Hand Hole Reinforcing Frame,
4" X 6" X 12", 3 Gauge (Min)
with Beveled Edges Inside
and No Cover

11 Gauge Thick Cover Plate Backed
with Full Width 3/4" Thick Gasket
with Chain or Cable

2" Half Coupling
with Internal Threads

2" Dia. Hole

Grounding Lug

Section C-C

Note: Unless otherwise specified, locate Terminal Compartment
1 foot above the pole base plate at 180 degrees on the
pole's radial index.

8 Bolt Pattern
Construct Templates and Plates from 1/4" min. Thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details

4 Bolt Pattern

12 Bolt Pattern
Plate Width = 4" min. (TYP for all plates)

8 Bolt Pattern

Provide 4 heavy hex nuts
and 4 flat washers per
anchor bolt (TYP). Min.
thread projection
at top of bolt = 10" for
2" diameter bolt (TYP).
Galvanize a minimum of 2"
below threads from top of
bolt.

Shaft I.D. Tag
(Provide on each section of a multi-section mast arm)

Note: See Strain Pole drawing W3 and Mast arm
drawing W4 for base plate weld details.

Base Plate Size as
required by Design
Loading

Typical Fabrication Details
Common To All Metal Poles

Identification Tag Details

Shaft I.D. Tag
(Provide on strain poles and mast arm poles)

Notes:
1) D = Diameter, T = Thickness, L = Length, Y = Yield Strength
2) A.B. = Anchor Bolt
3) B.C. = Bolt Circle of Anchor Bolts
4) If Custom Design, use "NCDOH STANDARD" line for pole I.D. number and
   Signal Inv. Number.
5) See drawing W4 for mounting positions of I.D. tags.

Grounding Lug
Welded Ring Stiffened Mast Arm Connection

Plan View

Side Gusset Plate (Typ)
Top Ring Plate
Side Gusset Plate (Typ)
2" Diameter Pipe for Wiring
Flange Angle
6" X 8" Hand hole w/ cover
Bottom Ring Plate
![Diagram of a welded ring stiffened mast arm connection with labels for various components such as side gusset plate, top ring plate, 2" diameter pipe, flange angle, 6" X 8" hand hole, and bottom ring plate.]

Bottom View

Side Elevation View

Back Ring
2" Diameter Pipe for Wire entrance to pole
High Strength Bolt + hardened flat washer (Typ)
Full-Penetration Groove Weld Detail (See Section B-B)
Plate Width
Bolt Sp.
Plate Height
Top Ring Plate
See Note 1
Backing Ring
3g" Max
Mast Arm Wall
Bolt Hole Diameter = Bolt + 1/4" (Typ)

Front Elevation View

Section View A-A

Mast Arm Attachment Plate

Back Elevation View

Notes:
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing appropriate drainage points.

Section B-B

Full-Penetration Groove Weld Detail

T = Arm Wall Thickness
Reinforcing Steel Table for Standard Drill Per Shaft (4'-0" Diameter)

<table>
<thead>
<tr>
<th>Shaft Dia. (in)</th>
<th>Conc. Volume (cu yds)</th>
<th>For Home</th>
<th>AMK</th>
<th>Size</th>
<th>Type</th>
<th>Length</th>
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</thead>
<tbody>
<tr>
<td>48&quot;</td>
<td>.466 x L</td>
<td>V1</td>
<td>83</td>
<td>27</td>
<td>#2</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1. The number of C-bars is based on foundation depth and/or as required. For standard foundations, see sheets M-6 and M-9 for details.
2. Circular tie reinforcing rings may be vertically adjusted by 1'-3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering into the cage.
3. The length of V1-bars is based on foundation depth. For standard foundations, see sheets M-6 and M-9 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by 1'-3" to facilitate the installation of electrical conduit entering into the cage.
4. Provide vertical reinforcement as required per design. See sheets M-9 and M-10 for details.

Typical Foundation Anchor Bolt Details
(Reinforcing Cage Not Shown for Clarity)

Typical Conduit Details

2-1/2" Nonmetallic Conduits for Electrical Service and Grounding Electrode Conductor
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

CABARRUS COUNTY

LOCATION: US 29-US 601 FROM JUST NORTH OF SR 1394 POPLAR TENT ROAD AND MCGILL AVE TO JUST SOUTH OF SR 1394 POPLAR TENT ROAD AND MCGILL AVE

TYPE OF WORK: COMMUNICATIONS CABLE AND CONDUIT ROUTING

INDEX OF PLANS

<table>
<thead>
<tr>
<th>SHEET</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIG. 12</td>
<td>TITLE SHEET</td>
</tr>
<tr>
<td>SIG. 13</td>
<td>COMMUNICATIONS CABLE AND CONDUIT ROUTING LEGEND SHEET</td>
</tr>
<tr>
<td>SIG. 15-18</td>
<td>COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS</td>
</tr>
<tr>
<td>SIG. 19-20</td>
<td>SPICE DIAGRAMS</td>
</tr>
</tbody>
</table>

NC DOT CONTACTS:
Transportation Mobility and Safety Branch
Sherry L. Williams, M.E. - Western Region Signals Engineer
Zachary M. Little, P.E. - Signals Project Engineer
I. Neil Avery - Signal Communications Project Engineer

STANTEC CONTACTS:
Betsy L. Watson, P.E. - Transportation Engineer
Brian Luter, P.E. - Transportation Designer

Legend

Stantec Consulting Services Inc
501 Jones Franklin Road Suite 300
Raleigh, NC 27605
Tel: (919) 651-8888
Fax: (919) 651-7324
www.stantec.com
License No. F-0023
1) COORDINATE WITH CITY OF CONCORD FOR ATTACHMENT HEIGHT FOR COMMUNICATION CABLES.

2) EXISTING AERIAL SPLICE ENCLOSURE. STORE NEW FIBER ON STORAGE RACKS, DO NOT ENTER SPLICE ENCLOSURE. CITY OF CONCORD WILL HANDLE SPLICING OF NEW FIBER INTO TRUNK LINE. SPLICE DETAIL #2 FOR THIS LOCATION IS INCLUDED FOR REFERENCE ONLY.

3) THE ATTACHMENT POINT FOR COMMUNICATIONS CABLE MUST MAINTAIN A MINIMUM OF 40" BELOW POWER AND/OR A MINIMUM OF 30" BELOW BOTTOM OF TRANSFORMER (WHICHEVER IS GREATER).

GENERAL NOTE

THERE IS AN EXISTING CITY OF CONCORD 96-FIBER TRUNK LINE RUNNING ALONG THE EAST SIDE OF US HWY 29 (CONCORD PARKWAY). CONTRACTOR IS NOT TO DISTURB THIS FIBER. CITY OF CONCORD WILL HANDLE SPLICING OF NEW FIBER INTO THIS TRUNK LINE UPON PROJECT COMPLETION.
NOTES

1) THE ATTACHMENT POINT FOR COMMUNICATIONS CABLE MUST MAINTAIN A MINIMUM OF 40" BELOW POWER AND/OR A MINIMUM OF 30' BELOW BOTTOM OF TRANSFORMER (WHICHEVER IS GREATER).

GENERAL NOTE

THERE IS AN EXISTING CITY OF CONCORD 96-FIBER TRUNK LINE RUNNING ALONG THE EAST SIDE OF US HWY 29 (CONCORD PARKWAY). CONTRACTOR IS NOT TO DISTURB THIS FIBER. CITY OF CONCORD WILL HANDLE SPLICING OF NEW FIBER INTO THIS TRUNK LINE UPON PROJECT COMPLETION.
NOTES
1) COORDINATE WITH CITY OF CONCORD
   FOR ATTACHMENT HEIGHT FOR
   COMMUNICATION CABLES.

BOND TRACER WIRE
TO EQUIPMENT
GROUND BUS

C-9515

BOND RISER AND
MESSENGER CABLE TO
POLE GROUND

1 4 12
47 56
SEE NOTE 1

2 4 12
2 4 12
1 12 2

47 56

51

2 4 12
7 8 19 2
18

40 52

45

MATCHLINE B
MATCHLINE C
NOTES
1) COORDINATE WITH CITY OF CONCORD FOR ATTACHMENT HEIGHT FOR COMMUNICATION CABLES.
2) EXISTING CITY OF CONCORD PULLBOX.
EXISTING SIGNAL (DETAIL #3)

LEGEND
X = FUSION SPICE
COLOR CODE
TAWSA, 566-A

US-29 (Concord Pike)
AT
SR-1394 (Poplar Tnvl Rd/96IB Ave)
Sig. INV. # 10-0448

NOTES:
- Unused fibres left coiled and stored in splice tray.
- Unused buffer tube left coiled and stored in splice tray.

PATCH PANEL, WITH
ST CONNECTORS

1/2 External Switch
(Due to Space Limitations)

SPICE TRAY

INCLUDE ON THE COVER OF EACH SPICE TRAY THE FOLLOWING
REFERENCE SECTION 1731 "FIBER OPTIC SPICE ELOUSURE"
1) SPICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPlicing

PRIOR TO INSTALLING THE COVER ON THE SPICE TRAY TAKE A
PHOTOGRAPH SHOWING THE SPICE TRAY AND
INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH
ALONG WITH OTDR TEST RESULTS.

NEW SIGNAL (DETAIL #4)

LEGEND
X = FUSION SPICE
COLOR CODE
TAWSA, 566-A

McGil Av., U-Turn Bulb
CONCRETE SUPPLY
SIG. INV. # C-6815

NOTES:
- Unused fibres left coiled and stored in splice tray.
- Unused buffer tube left coiled and stored in splice tray.

PATCH PANEL, WITH
ST CONNECTORS

1/2 External Switch (Due to Space Limitations)

SPICE TRAY

EXISTING SIGNAL (DETAIL #5)

LEGEND
X = FUSION SPICE
COLOR CODE
TAWSA, 566-A

US-29 with U-Turn Bulb
AT
Centre Dr.
Sig. INV. # C-6803

NOTES:
- Unused fibres left coiled and stored in splice tray.
- Unused buffer tube left coiled and stored in splice tray.

PATCH PANEL, WITH
ST CONNECTORS

1/2 External Switch
(Due to Space Limitations)

SPICE TRAY

NEW SIGNAL (DETAIL #6)

LEGEND
X = FUSION SPICE
COLOR CODE
TAWSA, 566-A

US-29 with U-Turn Bulb
Sig. INV. # 10-2104

NOTES:
- Unused fibres left coiled and stored in splice tray.
- Unused buffer tube left coiled and stored in splice tray.

PATCH PANEL, WITH
ST CONNECTORS

1/2 External Switch
(Due to Space Limitations)

SPICE TRAY

INCLUDE ON THE COVER OF EACH SPICE TRAY THE FOLLOWING
REFERENCE SECTION 1731 "FIBER OPTIC SPICE ELOUSURE"
1) SPICE LOCATION
2) DATE
3) COMPANY NAME
4) NAME OF INDIVIDUAL PERFORMING THE SPlicing

PRIOR TO INSTALLING THE COVER ON THE SPICE TRAY TAKE A
PHOTOGRAPH SHOWING THE SPICE TRAY AND
INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH
ALONG WITH OTDR TEST RESULTS.
EXISTING WATER SERVICE SYSTEM

PROPOSED WATER SYSTEM MODIFICATIONS

NOTE:
1. Backflow preventers to be tested per the City of Concord backflow prevention requirement prior to service activation.
2. Contractor shall provide temporary water service to the existing line.
3. Any shut downs of water services shall be coordinated with the property owner.
4. All construction and materials shall be in accordance with the City of Concord standard specifications.
5. All pipe and fittings shall be restrained joint, provide mechanical joint restraints.
6. Backfill materials for existing vaults to be approved by the City of Concord Engineering Dept.
7. 18" Drain pipe shall be relaid as needed.
8. 2' x 2' concrete slab with 6000 psi class A concrete with max #8 wire reinforcement.
9. Existing utility vaults exist. Min. of 2' between utility vaults.

PROPOSED METER VAULT SECTION

PROPOSED METER VAULT PLAN

DOUBLE LEAF HINGE ALUMINUM GATE WITH STAINLESS STEEL PIN HINGES. STAINLESS STEEL PIN APPROVED EQUAL: 64" X 48" H-20 LOCKS

PROPOSED METER VAULT MODIFICATIONS

TOP OF DOOR TO O.D. FINISHED EARTH ON SIDEWALK ELEVATION

PROPOSED METER VAULT SECTION

PROPOSED METER VAULT PLAN

RELOCATED 6"X6" BACKFLOW AND METER RELOCATIONS

NOT TO SCALE
NOTES FOR PUNCHY’S PARKING LOT DESIGN

1. CONTRACTOR TO REMOVE EXISTING CURB AND GUTTER AS SHOWN.
2. CONTRACTOR TO REMOVE EXISTING ASPHALT AT CURB ISLANDS.
3. CONTRACTOR TO INSTALL NEW CURB & GUTTER AS SHOWN.
4. CONTRACTOR TO INSTALL 6" CMC AND 2" ASPHALT SURFACE COURSE AS SHOWN.
5. CONTRACTOR TO APPLY AN ASPHALT BASED PAVEMENT SEALER. MAX DRY TIME = 8 HOURS. SEALER SHOULD MEET ASTM D 669, ASTM D 244 AND ASTM D 5117. COATING SHOULD BE BLACK. SEALER SHOULD BE SPRAY APPLIED. CONTRACTOR TO INSTALL PRODUCT FOLLOWING MANUFACTURER’S RECOMMENDATIONS.

6. APPROXIMATE QUANTITIES FOR THE ABOVE WORK:
- UNCENTERED EXCAVATION (INCQUT 225) 21 CY
- REMOVE EXISTING ASPHALT PAVEMENT (INCQUT 230) 202.39 T
- 2" 5" CONCRETE CURB AND GUTTER (INCQUT 846) 630 LF
- AGGREGATE BASE COURSE (INCQUT 500) 33.87 TN
- ASPHALT CONCRETE SURFACE COURSE, TYPE 395.5A 43 TN
- ASPHALT BASED PAVEMENT SEALER 504 DF
- PAINT PAVEMENT MARKING LINE, 1" (INCQUT 220) 1,569.47 LF
- PAINT PAVEMENT MARKING SYMBOL, (INCQUT 225) 7 EA
- NATHAN CREME APPETITE 1/4" 1" NW, 6" 6" (INCQUT 1678) 4 EA
- COLUMBIA PIGMENT 230/2000, 1 GAL, (INCQUT 1678) 3 EA
- MULCH FOR PLANTINGS (INCQUT 1670) 35 CY

PLAN
SCALE: 1" = 20'