Reading, Understanding, and Using Construction Plans

Delaware T²/LTAP

Delaware T²/LTAP Center

Delaware T^2 Center

- T^2 Centers or LTAPs located in all 50 states
- Funded by FHWA and state DOTs
- Mission – promote training, tech transfer, research implementation at local level
- Delaware T^2 hosted by University of Delaware, part of Delaware Center for Transportation
- Delaware T^2 funded by FHWA and DelDOT

Delaware T²/LTAP

Municipal Circuit Rider Program

- Delaware Center for Transportation
  - T^2/LTAP Center
  - Based at University of Delaware
  - Dr. Earl “Rusty” Lee – Director, DCT, T^2/LTAP Program Coordinator
- Matheu J. Carter, P.E.
  - T^2 Engineer
  - Engineering Circuit Rider

Delaware
T^2/LTAP

The Preliminaries

Today's Instructor:

- Matheu J. Carter, P.E. – Engineering Circuit Rider

Restrooms, smoking, parking, etc.

Standard Reminders:

- Cell phones, pagers, beepers, walkie-talkies
- Sidebar conversations

More Preliminaries

- Questions – any time
- We're a small crowd – let's keep it interactive and informal
- Sharing of thoughts or examples – any time
- These slides will be posted on our website – see link on your notes

Are you on our mailing list?

- Click here to take our 1 minute questionnaire and be sure
  - https://delaware.ca1.qualtrics.com/jfe/form/SV_3fyvj3k8Z4IlzZj

- Ensures you get our:
  - Newsletters
  - Urgent technical briefs
  - Upcoming training workshop notifications

- Don't risk it! Do it today.

Construction Plans

- Public versus private project
  - Public
    - Probably just one of several sets of documents known collectively as the Contract Documents
  - Private
    - Can sometimes be a standalone document
- Small versus large project
  - Smaller projects may have substantially fewer and more basic Contract Documents

Contract Documents

- Collectively, these tell the Contractor
  - What it must construct
  - What it can and cannot use
  - Methods it can, must, or cannot use
  - Time limits, how it gets paid, etc.
- Collectively, these tell the Owner
  - What its authority is
  - How and when it can intervene

Contract Documents

Typical DOT Standard Specification language

- Each individual Contract Document is an essential part of the Contract and a requirement occurring in one is binding as though occurring in all. All of the Contract Documents are intended to be complementary and to describe and provide for a complete Contract.
- **[BUT,]** In the case of a discrepancy between the Contract Documents the governing ranking will be:
  - A. General Description
  - B. General Notices
  - C. Plans
  - D. Special Provisions
  - E. Standard Construction Details
  - F. Standard Specifications

This is the so-called "hierarchy of documents"

Source: DelDOT, "Standard Specifications for Road and Bridge Construction," 105.06, August 2016

Documents During Construction

Many other documents generated during construction

- Shop drawings (working drawings)
- Testing results (QA/QC)
- RFIs (Requests for Information)
- Change orders
- Schedules
- Correspondence
- Reports (geotechnical, environmental, etc.)

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“Typical” Organization

- Lots of styles, arrangements, formats
- A “typical” arrangement from DelDOT
  - Title, Index, Legend, Notes, and Earthwork
  - Typical Sections
  - Horizontal and Vertical Control
  - Construction Plans
  - Profiles
  - Grades and Geometrics
  - Pavement Joint Plans

“Typical” Organization

- A “typical” arrangement from DelDOT (cont’d)
  - Borrow Site Grading Plans, Laydown Area, and Borrow Site Notes
  - Construction Details
  - Bridge Plans and Details
  - Retaining Wall Plans and Details
  - Maintenance of Stream Flow
  - Stormwater Management

“Typical” Organization

- A “typical” arrangement from DelDOT (cont’d)
  - Environmental Compliance
  - Traffic Control Notes & Phasing, MOT & E&S
  - Detour Plans
  - Lighting
  - Signing, Striping, Conduit & Signal Plans
  - Right-Of-Way Plans
- We’ll look at some of these

“Typical” Organization

- As we look at some of these drawings…
- …think about what role you might be in and which drawings would be of most use to you

- Inspector
- Testing Technician
- Surveyor
- Shop Drawing Reviewer
- Public Relations

- ROW Specialist
- Bridge Forman
- Pipe Forman
- Bidder
- Precaster

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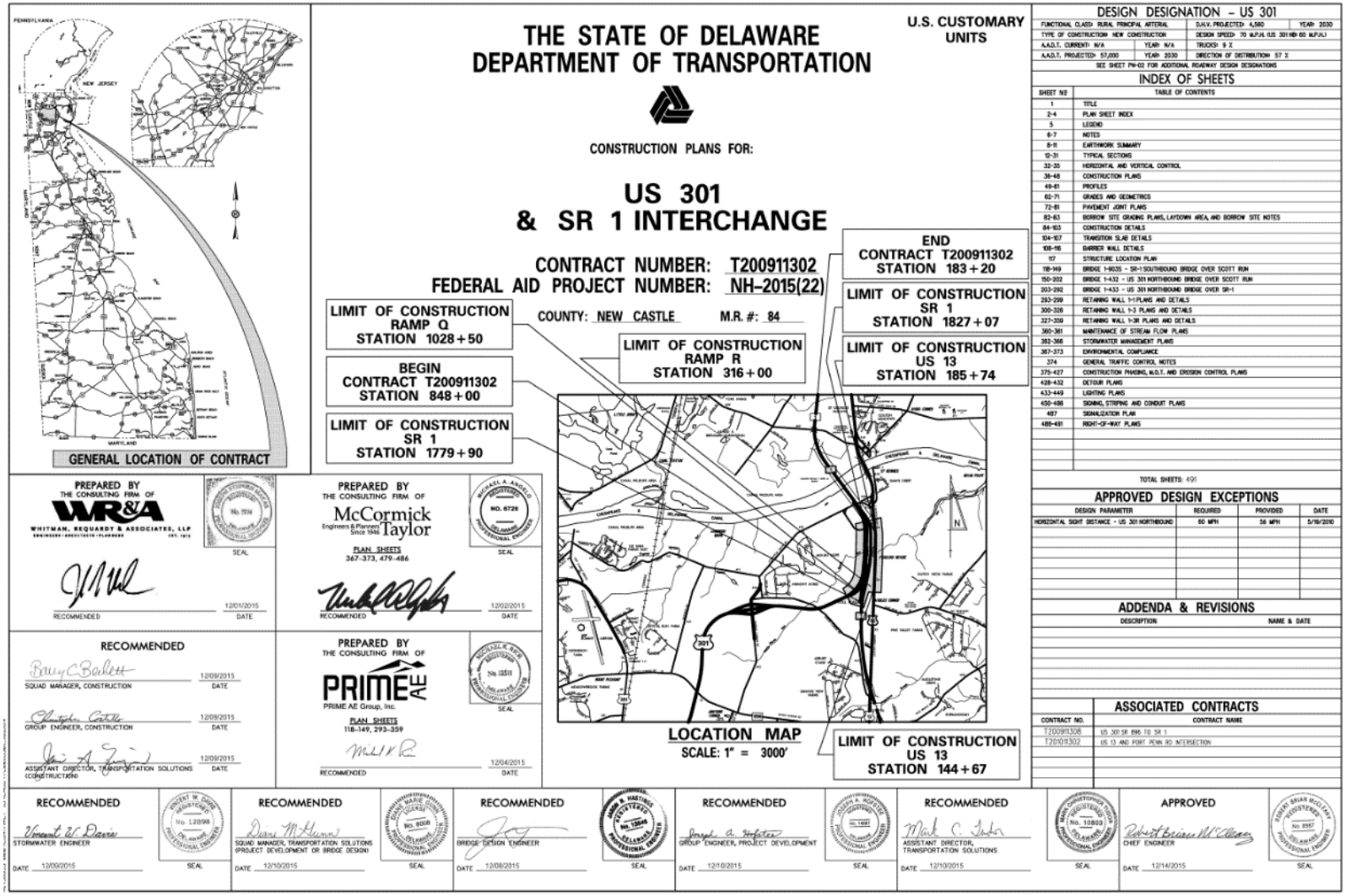
Title Sheet



THE STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION

U.S. CUSTOMARY UNITS

CONSTRUCTION PLANS FOR:

US 301
& SR 1 INTERCHANGE

CONTRACT NUMBER: T200911302
FEDERAL AID PROJECT NUMBER: NH-2015(22)

COUNTY: NEW CASTLE M.R. #: 84

GENERAL LOCATION OF CONTRACT

LIMIT OF CONSTRUCTION RAMP Q STATION 1028+50

BEGIN CONTRACT T200911302 STATION 848+00

LIMIT OF CONSTRUCTION SR 1 STATION 1779+90

LIMIT OF CONSTRUCTION RAMP R STATION 316+00

END CONTRACT T200911302 STATION 183+20

LIMIT OF CONSTRUCTION SR 1 STATION 1827+07

LIMIT OF CONSTRUCTION US 13 STATION 185+74

LOCATION MAP
SCALE: 1" = 3000'

LIMIT OF CONSTRUCTION US 13 STATION 144+67

PREPARED BY THE CONSULTING FIRM OF WR&A WHITMAN, REQUARDT & ASSOCIATES, LLP

SEAL

RECOMMENDED 12/01/2015 DATE

PREPARED BY THE CONSULTING FIRM OF McCormick Taylor Engineers & Planners Since 1946

PLAN SHEETS 367-373, 479-486

SEAL

RECOMMENDED 12/02/2015 DATE

RECOMMENDED

SQUAD MANAGER, CONSTRUCTION 12/09/2015 DATE

GROUP ENGINEER, CONSTRUCTION 12/09/2015 DATE

ASSISTANT DIRECTOR, TRANSPORTATION SOLUTIONS (CONSTRUCTION) 12/09/2015 DATE

PREPARED BY THE CONSULTING FIRM OF PRIME AE PRIME AE Group, Inc.

PLAN SHEETS 118-149, 293-359

SEAL

RECOMMENDED 12/04/2015 DATE

RECOMMENDED

STORMWATER ENGINEER 12/09/2015 DATE SEAL

RECOMMENDED

SQUAD MANAGER, TRANSPORTATION SOLUTIONS (PROJECT DEVELOPMENT OR BRIDGE DESIGN) 12/10/2015 DATE SEAL

RECOMMENDED

BRIDGE DESIGN ENGINEER 12/08/2015 DATE SEAL

RECOMMENDED

GROUP ENGINEER, PROJECT DEVELOPMENT 12/10/2015 DATE SEAL

RECOMMENDED

ASSISTANT DIRECTOR, TRANSPORTATION SOLUTIONS 12/10/2015 DATE SEAL

APPROVED

CHIEF ENGINEER 12/14/2015 DATE SEAL

DESIGN DESIGNATION – US 301

FUNCTIONAL CLASS: RURAL PRINCIPAL ARTERIAL		D.H.V. PROJECTED: 4,580	YEAR: 2030
TYPE OF CONSTRUCTION: NEW CONSTRUCTION		DESIGN SPEED: 70 M.P.H. (US 301 NB 60 M.P.H.)	
A.A.D.T. CURRENT: N/A	YEAR: N/A	TRUCKS: 9 %	
A.A.D.T. PROJECTED: 57,000	YEAR: 2030	DIRECTION OF DISTRIBUTION: 57 %	

SEE SHEET PM-02 FOR ADDITIONAL ROADWAY DESIGN DESIGNATIONS

INDEX OF SHEETS

SHEET NO	TABLE OF CONTENTS
1	TITLE
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327-359	RETAINING WALL 1-3R PLANS AND DETAILS
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362-366	STORMWATER MANAGEMENT PLANS
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375-427	CONSTRUCTION PHASING, M.O.T. AND EROSION CONTROL PLANS
428-432	DETOUR PLANS
433-449	LIGHTING PLANS
450-486	SIGNING, STRIPING AND CONDUIT PLANS
487	SIGNALIZATION PLAN
488-491	RIGHT-OF-WAY PLANS

TOTAL SHEETS: 491

APPROVED DESIGN EXCEPTIONS

DESIGN PARAMETER	REQUIRED	PROVIDED	DATE
HORIZONTAL SIGHT DISTANCE - US 301 NORTHBOUND	60 MPH	56 MPH	5/19/2010

ADDENDA & REVISIONS

DESCRIPTION	NAME & DATE

ASSOCIATED CONTRACTS

CONTRACT NO.	CONTRACT NAME
T200911308	US 301 SB RMP TO SR 1
T201011302	US 13 AND FORT PENN RD INTERSECTION

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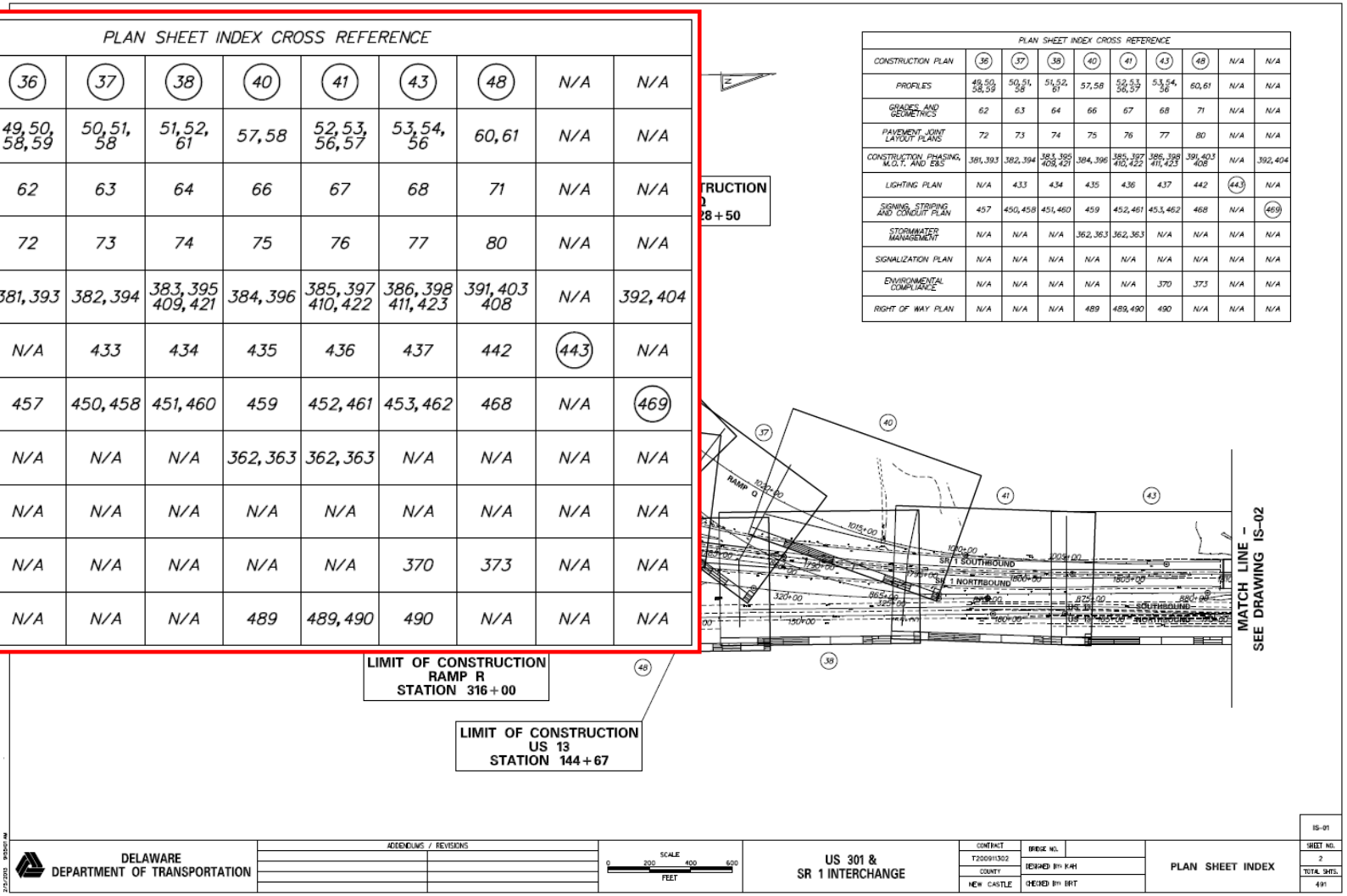
Plan Sheet Index

PLAN SHEET INDEX CROSS REFERENCE									
CONSTRUCTION PLAN	(36)	(37)	(38)	(40)	(41)	(43)	(48)	N/A	N/A
PROFILES	49, 50, 58, 59	50, 51, 58	51, 52, 61	57, 58	52, 53, 56, 57	53, 54, 56	60, 61	N/A	N/A
GRADES AND GEOMETRICS	62	63	64	66	67	68	71	N/A	N/A
PAVEMENT JOINT LAYOUT PLANS	72	73	74	75	76	77	80	N/A	N/A
CONSTRUCTION PHASING, M.O.T. AND E&S	381, 393	382, 394	383, 395 409, 421	384, 396	385, 397 410, 422	386, 398 411, 423	391, 403 408	N/A	392, 404
LIGHTING PLAN	N/A	433	434	435	436	437	442	(443)	N/A
SIGNING, STRIPING AND CONDUIT PLAN	457	450, 458	451, 460	459	452, 461	453, 462	468	N/A	(469)
STORMWATER MANAGEMENT	N/A	N/A	N/A	362, 363	362, 363	N/A	N/A	N/A	N/A
SIGNALIZATION PLAN	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
ENVIRONMENTAL COMPLIANCE	N/A	N/A	N/A	N/A	N/A	370	373	N/A	N/A
RIGHT OF WAY PLAN	N/A	N/A	N/A	489	489, 490	490	N/A	N/A	N/A



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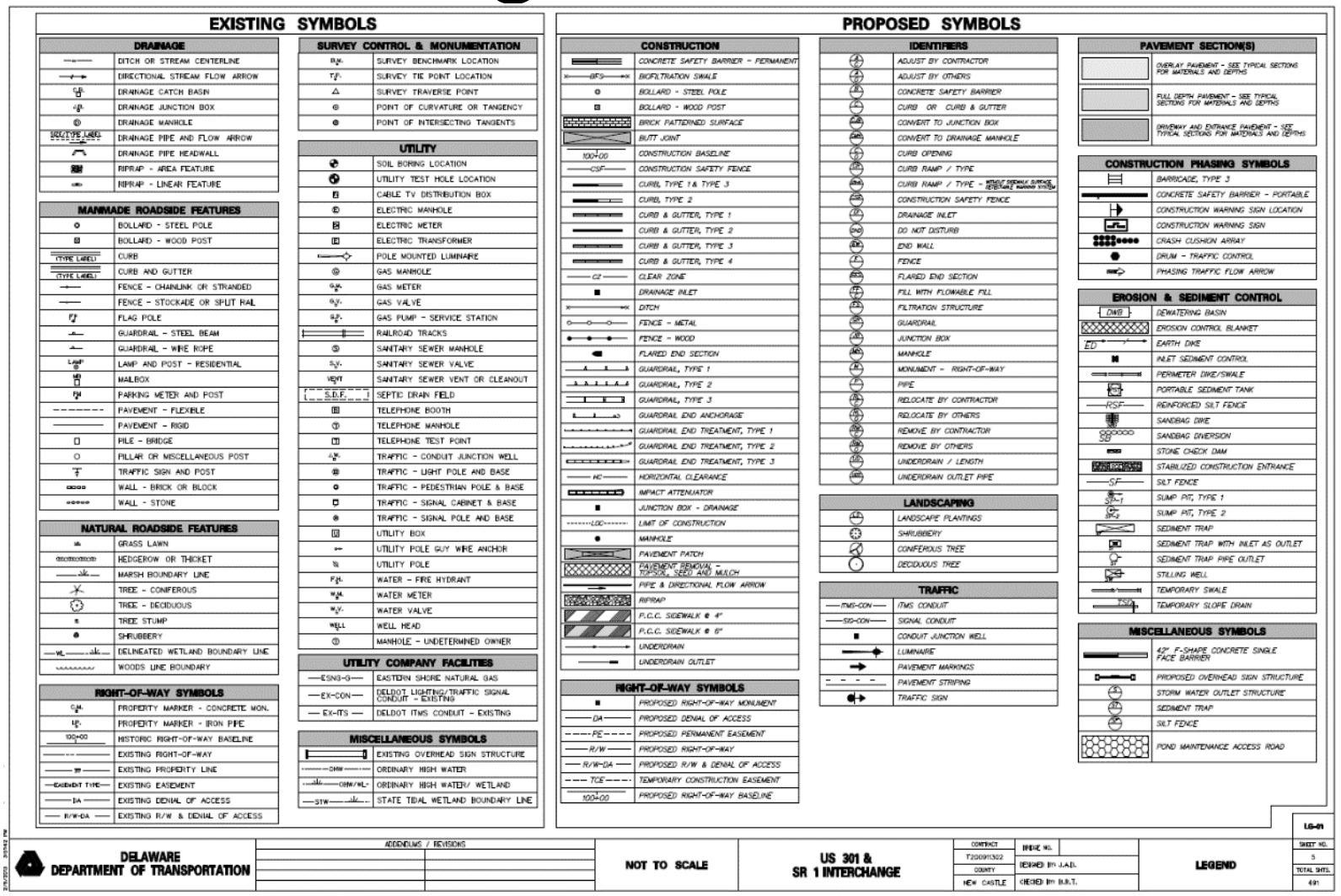
Legend Sheet



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General Notes

GENERAL NOTES

1. THIS PROJECT IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS", DATED AUGUST 2001 AND THE DELAWARE DEPARTMENT OF TRANSPORTATION "STANDARD CONSTRUCTION DETAILS", DATED 2001, INCLUDING ALL REVISIONS UP TO THE DATE OF ADVERTISEMENT.

2.

EROSION POTENTIAL FOR THIS PROJECT	CONTRACTOR ESC SUPERVISOR REQUIREMENT
( ) INSIGNIFICANT	NONE
( ) MINOR	CONTRACTOR TRAINING PROGRAM, AS DEFINED IN SECTION 6.2 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
( ) MEDIUM	CONTRACTOR TRAINING PROGRAM, AS DEFINED IN SECTION 6.2 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.
( ) MAJOR	CERTIFIED CONSTRUCTION REVIEWER (CCR), AS DEFINED IN SECTION 6.3 OF THE DELAWARE SEDIMENT AND STORMWATER REGULATIONS.

3. ELECTRONIC PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE CONTRACTOR INCLUDE:

( )	NONE
(X)	ASCII DATA FILES WITH COORDINATES AND ELEVATIONS FOR PROPOSED POINTS AS SELECTED BY THE ENGINEER.
(X)	ALL PLAN SHEETS, IN PDF FORMAT.
(X)	EXISTING DIGITAL TERRAIN MODEL, IN .DTM FILE FORMAT, COMPATIBLE WITH SOFTWARE CURRENTLY USED BY DELDOT.
(X)	PROPOSED DIGITAL TERRAIN MODEL, IN .DTM FILE FORMAT, COMPATIBLE WITH SOFTWARE CURRENTLY USED BY DELDOT.
(X)	DESIGN FILE IN .DGN FILE FORMAT, CONTAINING ONLY THE PROPOSED 3D TRIANGLES OF THE PROPOSED DIGITAL TERRAIN MODEL (DTM).

NOTED THE DOCUMENT ENTITLED "RELEASE FOR DELIVERY OF DOCUMENTS IN ELECTRONIC FORM TO A CONTRACTOR" MUST BE SIGNED BY ALL PARTIES PRIOR TO THE DELIVERY OF ANY ELECTRONIC PROJECT FILES.

4. PROJECT FILES THAT WILL BE MADE AVAILABLE TO THE CONTRACTOR, INCLUDE:

(X)	CROSS SECTIONS
(X)	RIGHT-OF-WAY PLANS (WILL BE MADE AVAILABLE TO THE AWARDED CONTRACTOR)

5. AMERICAN TRAFFIC SAFETY SERVICES ASSOCIATION (ATSSA) CERTIFIED TRAFFIC CONTROL SUPERVISOR REQUIREMENT FOR THIS PROJECT:

( )	THE CONTRACTOR SHALL NOT BE REQUIRED TO HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT.
( )	THE CONTRACTOR SHALL HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT. THE CONTRACTOR'S GENERAL SUPERINTENDENT FOR THIS PROJECT OR ANOTHER ATSSA CERTIFIED MEMBER OF THE CONTRACTOR'S PROJECT STAFF MAY BE THE ATSSA SUPERVISOR. PAYMENT FOR ATSSA SUPERVISOR IS INCIDENTAL TO ITEM 743000.
( )	THE CONTRACTOR SHALL HAVE AN ATSSA SUPERVISOR ASSIGNED TO THIS PROJECT. THE ATSSA SUPERVISOR'S SOLE JOB SHALL BE SUPERVISION OF THE INSTALLATION, OPERATION AND MAINTENANCE OF TRAFFIC CONTROL DEVICES FOR THIS PROJECT. THE CONTRACTOR'S GENERAL SUPERINTENDENT FOR THIS PROJECT SHALL NOT BE THE ATSSA SUPERVISOR. PAYMENT FOR ATSSA SUPERVISOR SHALL BE PAID FOR UNDER ITEM 743015.

6. THE DISTURBED AREA FOR THIS PROJECT IS 53.77 ACRES.

7. THE SEDIMENT AND STORMWATER MANAGEMENT PLANS HAVE BEEN APPROVED BY DELDOT'S STORMWATER ENGINEER UNDER DELDOT'S DELEGATED AUTHORITY. THE SEDIMENT AND STORMWATER MANAGEMENT PLANS ARE VALID FOR A THREE YEAR PERIOD, BEGINNING ON THE DATE THE STORMWATER ENGINEER SIGNED THE CONSTRUCTION TITLE SHEET. IF THE FINAL ACCEPTANCE OF THE PROJECT IS ANTICIPATED TO EXTEND BEYOND THE THREE YEARS, THE CONTRACTOR SHALL INFORM THE ENGINEER THREE MONTHS PRIOR TO THE EXPIRATION OF THE SEDIMENT AND STORMWATER MANAGEMENT PLAN APPROVAL. DELDOT WILL REVIEW THE CURRENT SEDIMENT AND STORMWATER MANAGEMENT PLAN AND ISSUE AN EXTENSION WITH ANY APPROPRIATE MODIFICATIONS.

PROJECT NOTES

SECTION 100

1. ANY DAMAGE TO ITEMS NOTED TO BE RELOCATED OR REMET BY THE CONTRACTOR, AT THE DISCRETION OF THE ENGINEER, SHALL BE REPAIRED AND/OR REPLACED IN KIND AT THE CONTRACTOR'S EXPENSE.

2. PRIOR TO PERFORMING ANY WORK ON THE PROJECT, THE CONTRACTOR AND THE ENGINEER'S REPRESENTATIVE SHALL JOINTLY PERFORM SUFFICIENT FIELD SURVEYS TO VERIFY THE ADVERTISED CROSS SECTIONS AND ELECTRONIC PROJECT FILES AND AGREE ON THE RESULTS TO ESTABLISH INITIAL GROUND ELEVATIONS THAT SHALL BE USED IN CALCULATING QUANTITIES. ANY DISCREPANCIES FOUND SHALL BE AGREED UPON PRIOR TO BEGINNING EARTHWORK OPERATIONS. ALL COSTS SHALL BE INCLUDED IN ITEM 783501 - CONSTRUCTION ENGINEERING.

3. PRIOR TO PERFORMING ANY WORK IN AREAS WHERE ADVANCE GRADING HAS BEEN PERFORMED UNDER OTHER CONTRACTS, THE CONTRACTOR AND THE ENGINEER'S REPRESENTATIVE SHALL JOINTLY PERFORM FIELD SURVEYS AND AGREE ON THE RESULTS TO ESTABLISH INITIAL GROUND ELEVATIONS THAT SHALL BE USED IN CALCULATING QUANTITIES. ALL COSTS SHALL BE INCLUDED IN ITEM 783501 - CONSTRUCTION ENGINEERING.

4. DELETE IN ITS ENTIRETY STANDARD SPECIFICATION SUBSECTION 104.10 "RIGHTS IN AND USE OF MATERIALS FOUND ON THE WORK" AND REPLACE WITH THE FOLLOWING: THE CONTRACTOR CAN EXPECT TO ENCOUNTER HORIZONTAL AND VERTICAL DEPOSITS OF MATERIALS IN THE ON-SITE BORROW SITES, ROADWAY EXCAVATIONS, OR EXCAVATION FROM OTHER WORK ITEMS THAT WILL MEET THEREQUIREMENTS FOR BORROW TYPES A, C, D, F AND/OR FURNISHING BORROW, TYPE C AS WELL AS UNSUITABLE MATERIALS. ALL REFERENCES TO THESE VARIOUS BORROW TYPES IN THE PLANS AND SPECIAL PROVISIONS SHALL BE INTERPRETED TO MEAN MATERIALS OBTAINED FROM ON-SITE EXCAVATIONS MEETING THE GRADATION REQUIREMENTS OF THE BORROW TYPE STATED IN THE PLANS OR SPECIAL PROVISIONS. THE CONTRACTOR SHALL PERFORM THE EXCAVATIONS IN A METHOD APPROVED BY THE ENGINEER SO THAT THESE DEPOSITS OF MATERIAL ARE MADE AVAILABLE TO MEET THE PROJECT NEEDS. EXCESSIVE OR INSUFFICIENT MOISTURE CONTENT SHALL NOT BE CRITERIA FOR CLASSIFYING MATERIAL AS UNSUITABLE FOR USE. PAYMENT FOR ALL OF THESE BORROW TYPES INCORPORATED INTO THE PROJECT WILL BE MADE USING THE BID ITEM UNDER WHICH THE MATERIAL WAS ORIGINALLY EXCAVATED ON SITE. UNLESS APPROVED ON SPECIFIED OTHERWISE, BORROW, TYPE B IS INTENDED TO BE FURNISHED FROM A SOURCE OUTSIDE OF THE PROJECT LIMITS AND PAID FOR UNDER ITEM 209002, PLACEMENT, HAULING, STORING, AND COMPACTING OF ALL BORROW MATERIAL EXCAVATED ON SITE TO BE USED AS THE STATED BORROW TYPES A, C, D, F, AND OR UFURNISHING BORROW, TYPE C AS NOTED IN THE PLANS OR SPECIAL PROVISIONS IS INCIDENTAL TO THE ITEM UNDER WHICH IT WAS EXCAVATED (FOR EXAMPLE, ITEMS 202000, 207000, 208000, OR OTHERS AS APPLICABLE). THE MATERIALS SHALL BE PLACED INACCORDANCE WITH THEIR INTENDED USE BUT NO PAYMENT WILL BE MADE UNDER THE ITEMS FOR WHICH THE EXCAVATED MATERIALS ARE USED. THE CONTRACTOR IS RESPONSIBLE FOR MANAGING THE ON-SITE EXCAVATIONS TO INCLUDE LOCATING THE TYPES OF BORROW REQUIRED TO MEET THE PLAN NEEDS, STOCKPILING, HAULING, WETTING OR DRYING THE MATERIAL TO MEET STANDARD SPECIFICATION 203.05(F), AND MULTIPLE HANDLING IF NEEDED, WITH ALL COSTS INCIDENTAL TO THE ITEM UNDER WHICH THE MATERIAL WAS INITIALLY EXCAVATED. ALL REQUIRED EROSION AND SEDIMENT CONTROL WILL BE PAID SEPARATELY USING THE APPLICABLE BID ITEMS.

SECTION 200

5. THE ENGINEER MAY REQUIRE THE CONTRACTOR TO EXCAVATE TEST PITS ALONG PROPOSED DRAINAGE RUNS, AT POINTS OF POSSIBLE UTILITY CONFLICTS, TO DETERMINE IF A CONFLICT EXISTS. ANY CONFLICTS SHALL BE COORDINATED BY THE CONTRACTOR, WITH THE ENGINEER AND THE UTILITY COMPANY INVOLVED. THE ENGINEER SHALL LOCATE AND DETERMINE THE SOLUTION TO THE UTILITY CONFLICT. TEST HOLES SHALL BE MEASURED AND PAID FOR IN ACCORDANCE WITH ITEM 208000, BUT ONLY TO THE ACTUAL DEPTH EXCAVATED.

6. ITEMS TO BE REMOVED UNDER ITEM 211000 - REMOVAL OF STRUCTURES AND OBSTRUCTIONS SHALL INCLUDE, BUT NOT BE LIMITED TO THE FOLLOWING:
   A. CONCRETE SUPPORT FOUNDATIONS FOR TRAFFIC POLES, SIGN STRUCTURES, GROUND MOUNT SIGNS, CABINETS AND LIGHT POLES/ JUNCTION WELLS/ ELECTRICAL SERVICES AND EQUIPMENTS LIGHT POLES AND POLES FOR OTHER TRAFFIC CONTROL DEVICES/ AND OTHER MISCELLANEOUS TRAFFIC CONTROL DEVICE STRUCTURES) NOT COVERED UNDER OTHER PAY ITEMS.
   B. GAS MAIN AND SLEEVE THROUGH EXISTING SCOTT RUN BOX CULVERT.

7. UNLESS OTHERWISE INDICATED IN THE PLANS, UNDER ITEM 201003-CLEARING AND GRUBBING, ALL VEGETATION, TREES, STUMPS, ROOTMAT, ETC. SHALL BE REMOVED IN THEIR ENTIRETY WITHIN THE LIMITS OF CONSTRUCTION REGARDLESS OF THE EMBANKMENT HEIGHT EXCEPT SUCH OBJECTS AS ARE DESIGNATED TO REMAIN OR ARE TO BE REMOVED IN ACCORDANCE WITH OTHER SECTIONS OF THE CONTRACT DOCUMENTS. WORK UNDER ITEM 201003 IS TO BE PERFORMED IN ITS ENTIRETY EITHER BY THE CONTRACTOR OR AN APPROVED SUBCONTRACTOR. CUTTING OF FIREWOOD BY PRIVATE CITIZENS OR OTHER PARTIES SHALL NOT BE PERMITTED.

8. RIGHT-OF-WAY FENCING IS TO BE INSTALLED ALONG THE DENIAL OF ACCESS THROUGHOUT THE PROJECT LIMITS AS SHOWN ON THE PLANS. CLEARING AND GRUBBING OUTSIDE OF THE LIMITS OF CONSTRUCTION LINE FOR INSTALLATION OF THE RIGHT-OF-WAY FENCE, UTILITY RELOCATIONS DESCRIBED IN THE UTILITY STATEMENT, OR OTHER NECESSARY CONSTRUCTION SHALL BE KEPT TO A MINIMUM AND SHALL BE INCLUDED IN ITEM 201000. THERE SHALL BE NO GRUBBING OUTSIDE THE LIMITS OF CONSTRUCTION.

9. DELETE THE FIRST SENTENCE OF STANDARD SPECIFICATION SUBSECTION 203.03 (C) AND REPLACE WITH THE FOLLOWING: "ALL TOPSOIL, IF PRESENT, SHALL BE REMOVED IN ITS ENTIRETY IN BOTH CUT AND FILL SECTIONS, REGARDLESS OF EMBANKMENT HEIGHT."

10. EXISTING MATERIALS ALONG THE PROPOSED ROADWAY ALIGNMENTS HAVE THE POTENTIAL TO MEET THE REQUIREMENTS OF THE BORROW, TYPE A PORTION OF THE PROPOSED PAVEMENT SECTIONS. THE CONTRACTOR SHALL EXCAVATE TO THE TOP OF THE BORROW, TYPE A PORTION OF THE PROPOSED PAVEMENT SECTIONS AT WHICH TIME THE MATERIALS SHALL BE EVALUATED BY THE ENGINEER. IF THE MATERIALS ARE DEEMED SUITABLE FOR THE BORROW, TYPE A PORTION OF THE PROPOSED PAVEMENT SECTION, THEN ITEM 202215 - COMPACTING IN-SITU MATERIAL SHALL BE USED AS DIRECTED BY THE ENGINEER. IF THE MATERIALS ARE NOT DEEMED SUITABLE, THEN THE MATERIALS SHALL BE REMOVED WITH PAYMENT MADE UNDER ITEM 202000 - EXCAVATION AND EMBANKMENT AS DIRECTED BY THE ENGINEER AND MATERIAL MEETING THE REQUIREMENTS OF BORROW, TYPE A SHALL BE PLACED.

11. APPROVED COVERS SHALL BE INSTALLED OVER ALL LOADED TRUCKS OR TRAILERS HAULING BORROW, EXCAVATED MATERIALS, AGGREGATES, ETC. TO OR FROM THE PROJECT SITE OVER STATE MAINTAINED ROADS. THE COVERS SHALL BE INSTALLED TO PREVENT MATERIAL FROM LEAVING THE TRUCKS OR TRAILERS. THE MATERIAL SHALL BE FULLY COVERED AND THE COVERS TIED ON THE REAR AND BOTH SIDES. ANY MATERIALS DELIVERED, TRANSPORTED, OR REMOVED IN UNCOVERED TRUCKS OR TRAILERS WILL BE INCORPORATED INTO THE PROJECT, OR REMOVED FROM THE SITE, WITH NO PAYMENT TO THE CONTRACTOR FOR FURNISHING, REMOVING, OR PLACING THE MATERIALS.

12. WHEN PERFORMING ANY EXCAVATION OR BACKFILLING OPERATION, THE CONTRACTOR SHALL PROVIDE DEWATERING MEASURES AT ALL TIMES TO KEEP THE GROUNDWATER LEVEL AT LEAST ONE FOOT BELOW THE EXCAVATION ELEVATION, IN COMPLIANCE WITH DELDOT STANDARD SPECIFICATIONS, SECTION 111 - DEWATERING OPERATIONS. THE CONTRACTOR SHALL ALSO PROVIDE NECESSARY DEWATERING TO STABILIZE EXCAVATED SLOPES DURING CONSTRUCTION AND UNTIL THE SLOPES ARE STABILIZED AS DETERMINED BY THE ENGINEER. ALL COSTS SHALL BE INCIDENTAL TO THE APPLICABLE EXCAVATION OR BACKFILLING ITEM.

13. AS NOTED IN THE CONTRACT DOCUMENTS AND DIRECTED BY THE ENGINEER, MATERIALS ARE TO BE STOCKPILED FOR LATER USE IN THE PROJECT. THE TOPSOIL FROM THESE STOCKPILE AREAS SHALL BE REMOVED IN ITS ENTIRETY AND STOCKPILED FOR REPLACEMENT IN THE AREA WHERE IT WAS EXCAVATED. THE EXCAVATION AND STOCKPILING OF THE TOPSOIL SHALL BE MEASURED FOR PAYMENT UNDER ITEM 203000 - EXCAVATION AND EMBANKMENT. THE TOPSOIL SHALL BE REPLACED IN REASONABLY CLOSE CONFORMITY TO THE ORIGINAL LINES, GRADES AND ELEVATIONS AS DIRECTED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH REPLACING THE FULL DEPTH OF THE TOPSOIL REMOVED SHALL BE PAID UNDER ITEM 713002 - TOPSOILING, 6" DEPTH. THE AREA OF TOPSOIL REPLACED SHALL ONLY BE MEASURED ONCE FOR PAYMENT UNDER ITEM 713002 - TOPSOILING, 6" DEPTH, REGARDLESS OF THE FULL DEPTH OF TOPSOIL PLACED. SEEDING AND MULCHING OF THE REPLACED TOPSOIL SHALL BE PERFORMED UNDER THE APPLICABLE BID ITEMS.

14. FOR ESTIMATING PAYMENT FOR ALL EARTHWORK ITEMS, TWO-THIRDS OF THE FACTORY RATED CAPACITY OF THE EARTHWORK MOVING EQUIPMENT SHALL BE USED. FOR TEN-WHEEL DUMP TRUCKS, TEN (10) CUBIC YARDS SHALL BE USED.

PROJECT NOTES (CONT.)

SECTION 200 (CONT.)

15. STORMWATER MANAGEMENT POND EXCAVATION
   A. CLEARING AND GRUBBING OF STORMWATER POND AREAS IS TO BE INCLUDED IN THE LUMP SUM PRICE FOR ITEM 201000.
   B. ALL EXCAVATION AND EMBANKMENT REQUIRED FOR CONSTRUCTION OF STORMWATER PONDS WILL BE PERFORMED, MEASURED AND PAID FOR UNDER ITEM 202000, EXCAVATION AND EMBANKMENT. THE WORK WILL INCLUDE MEASUREMENT FOR:
      i. GENERAL POND EXCAVATION TO THE LINES AND GRADES SHOWN ON THE PLANS, INCLUDING THE INITIAL OVEREXCAVATION FOR USE OF THE SWM FACILITY AS A SEDIMENT BASIN IF INDICATED ON THE PLANS.
      ii. EXCAVATION FOR FOREBAYS, CUT-OFF TRENCHES, AND / OR CORE TRENCHES AS SHOWN ON THE PLANS.
   C. EXCAVATION BELOW THE DESIGNED POND FINISHED GRADE OR SUBGRADE ELEVATION FOR RIP-RAP PLACEMENT AND OUTLET STRUCTURE FOUNDATIONS WILL BE INCIDENTAL TO THOSE RESPECTIVE PAY ITEMS.
   D. INITIAL EXCAVATION OF SWM PONDS THAT FUNCTION AS INFILTRATION BASINS SHALL ONLY BE COMPLETED TO TWO (2) FEET ABOVE THE PERMANENT BOTTOM OF THE INFILTRATION BASIN. AFTER ALL AREAS CONTRIBUTING DRAINAGE TO THE INFILTRATION BASIN HAVE BEEN STABILIZED AS APPROVED BY THE ENGINEER, EXCAVATION TO THE PERMANENT BOTTOM ELEVATION OF THE INFILTRATION BASIN SHALL BE PERFORMED.
   E. EXCEPT AS NEEDED FOR CONSTRUCTION OF DAM FOUNDATIONS, CUTOFF TRENCHES, AND OUTLET STRUCTURES, EXCAVATED SUBGRADES WITHIN THE SWM PONDS SHALL NOT BE TEST ROLLED PER SUBSECTION 203.02 OR COMPACTED PER SUBSECTION 203.06.A.
   F. ALL REQUIREMENTS OF STANDARD SPECIFICATION SECTION 271 FOR CONSTRUCTION OF THE SWM FACILITY SHALL APPLY. IF THERE ARE CONFLICTS BETWEEN THE REQUIREMENTS IN STANDARD SPECIFICATION SECTION 271 AND STANDARD SPECIFICATION SECTION 203, THEN THE MORE STRINGENT REQUIREMENT SHALL BE FOLLOWED.

16. SEDIMENT BASIN CONSTRUCTION AND MAINTENANCE:
   A. CLEARING AND GRUBBING OF SEDIMENT BASIN POND AREAS IS TO BE INCLUDED IN THE LUMP SUM PRICE FOR ITEM 201000.
   B. ALL EXCAVATION AND EMBANKMENT REQUIRED FOR CONSTRUCTION OF SEDIMENT BASINS WILL BE PERFORMED, MEASURED AND PAID FOR UNDER ITEM 202000, EXCAVATION AND EMBANKMENT.
   C. REMOVAL OF SEDIMENT FROM THE SEDIMENT BASIN SHALL BE PERFORMED WHEN THE CLEANOUT ELEVATION IS REACHED AS NOTED ON THE PLANS.
   D. SEDIMENT REMOVAL FROM THE SEDIMENT BASIN SHALL BE MEASURED FOR PAYMENT UNDER ITEM 202000, ONLY REMOVAL OF SEDIMENT FROM A SEDIMENT BASIN SHALL BE MEASURED FOR PAYMENT UNDER ITEM 202000.
   E. REMOVAL OF SEDIMENT FROM ALL OTHER EROSION AND SEDIMENT CONTROL DEVICES AND REMOVAL OF SEDIMENT THAT HAS BYPASSED OR OTHERWISE NOT BEEN TRAPPED BY ANY SEDIMENT CONTROL DEVICE SHALL BE INCLUDED IN THE PAYMENT FOR THE SEDIMENT CONTROL ITEM PER SECTION 800.

SECTION 300

17. A. THE CONTRACTOR MAY ELECT TO USE ANY OF THE FOLLOWING MATERIALS TO MEET THE REQUIREMENTS OF ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B':
   a. CRUSHED STONE (PER STANDARD SPECIFICATION 820)
   b. CRUSHED CONCRETE (PER STANDARD SPECIFICATION 821)
   c. HOT-MIX MILLINGS (PER SPECIAL PROVISION 302514 MILLED HOT-MIX BASE COURSE)

   THE CONTRACTOR WILL NOT BE ALLOWED TO MIX DIFFERENT MATERIALS (OR SIMILAR MATERIALS FROM DIFFERENT SOURCES) TO MEET THE REQUIREMENTS OF ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.

   ALL OF THE ABOVE LISTED MATERIALS ARE PERMITTED FOR USE ON THE JOB, PROVIDED THEY ARE SEPARATED INTO APPROVED AREAS. EACH AREA OF BASE COURSE MUST BE CONSTRUCTED USING MATERIALS FROM A SINGULAR SOURCE, FULL DEPTH, IN ORDER THAT PROPER TESTING MAY BE ACCOMPLISHED. THE CONTRACTOR AND DELDOT'S PROJECT ENGINEER SHALL AGREE ON THE LIMITS OF EACH SOURCE OF MATERIAL PRIOR TO PLACEMENT.

   B. THE QUANTITY USED FOR BASE OF EACH OF THE ABOVE LISTED MATERIALS WILL BE THE CONTRACTOR'S CHOICE, WITH THE TOTAL MEETING THE ADVERTISED QUANTITY OF ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.

   C. THE CONTRACTOR MAY ALSO ELECT TO RECYCLE MILLINGS FOR USE IN WARM-MIX AS PERMITTED BY THE STANDARD SPECIFICATIONS. THE CHOICE OF THE QUANTITY OF MILLINGS USED FOR THIS PURPOSE, OR FOR BASE COURSE, LIES WITH THE CONTRACTOR. ALL MILLING MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR.

   D. HOT-MIX MILLINGS MAY BE GENERATED FROM THE FOLLOWING SOURCES:
      a. MATERIAL MADE AVAILABLE WHEN MILLED ON THIS CONTRACT UNDER SECTION 760 - PAVEMENT MILLING.
      b. MATERIAL MILLED ON THIS CONTRACT AT THE CONTRACTOR'S CHOICE UNDER ITEM 202000.
      c. MILLED MATERIAL FURNISHED ON THE JOB FROM THE CONTRACTOR'S YARD OR OTHER OUTSIDE SOURCE.

   ALL MILLED MATERIALS SHALL MEET THE MATERIAL REQUIREMENTS OF ITEM 302514 - MILLED HOT-MIX BASE COURSE.

   E. PAYMENT CLARIFICATION:
      a. SHOULD THE CONTRACTOR ELECT TO MILL PORTIONS OF HOT-MIX SHOWN ON THE PLANS TO BE REMOVED UNDER ITEM 202000 - EXCAVATION AND EMBANKMENT THE COST OF MILLING THIS HOT-MIX WILL BE PAID AS ITEM 202000 - EXCAVATION AND EMBANKMENT. THE MILLINGS GENERATED MAY BE RECYCLED INTO WARM-MIX, UTILIZED FOR BASE COURSE, OR DISPOSED OF TO AN APPROVED SITE. HAULING COSTS FOR DISPOSAL AND/OR RECYCLING ARE INCIDENTAL TO ITEM 202000 - EXCAVATION AND EMBANKMENT.
      b. MILLINGS GENERATED UNDER SECTION 760 - PAVEMENT MILLING, MAY BE RECYCLED INTO WARM-MIX, UTILIZED FOR BASE COURSE OR DISPOSED OF BY THE CONTRACTOR TO AN APPROVED SITE. NO SEPARATE PAYMENT WILL BE MADE FOR TRANSPORTING MILLINGS ON SITE OR TO AN APPROVED DISPOSAL SITE.
      c. SHOULD THE CONTRACTOR ELECT TO TEMPORARILY STOCKPILE MILLINGS ON THE JOB SITE FOR LATER USE, ALL COSTS FOR STOCKPILING AND SUBSEQUENT REHANDLING SHALL BE INCIDENTAL TO ITEM 202000 - EXCAVATION AND EMBANKMENT.
      d. MILLINGS USED FOR BASE COURSE SHALL BE PLACED IN ACCORDANCE WITH THE REQUIREMENTS OF SPECIAL PROVISION 302514 - MILLED HOT-MIX BASE COURSE. NO SEPARATE PAYMENT WILL BE MADE TO FURNISH MILLINGS FROM AN OUTSIDE SOURCE OR TRANSPORT MILLINGS WITHIN THE PROJECT LIMITS. MILLINGS USED FOR BASE COURSE WILL BE PAID IN PLACE AT THE UNIT BID PRICE FOR ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'.
      e. ALL COSTS TO UTILIZE MILLINGS IN RECYCLED WARM-MIX WILL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE WARM-MIX ITEM USING THE RECYCLED MATERIAL.
      f. SPECIAL PROVISION 302514 - MILLED HOT-MIX BASE COURSE IS PROVIDED TO SPECIFY THE MEANS OF LAY DOWN AND COMPACTION AS WELL AS THE MATERIAL REQUIREMENTS FOR MILLINGS USED AS BASE COURSE. ALL COSTS TO BRING THE MILLINGS INTO COMPLIANCE WITH THE REQUIREMENTS OF ITEM 302514 - MILLED HOT-MIX BASE COURSE ARE INCIDENTAL TO ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE 'B'. NO PAYMENT WILL BE MADE FOR ITEM 302514 - MILLED HOT-MIX BASE COURSE. THE QUANTITY OF MILLINGS USED FOR BASE COURSE WILL BE PAID FOR UNDER ITEM 302007 - GRADED AGGREGATE BASE COURSE.

PM-01

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	NOT TO SCALE	US 301 & SR 1 INTERCHANGE	CONTRACT T200913302	BRIDGE NO.	NOTES	SHEET NO. 6
				COUNTY NEW CASTLE	DESIGNED BY: J.A.D.		TOTAL SHTS. 491
					CHECKED BY: D.R.T.		

Delaware T²/LTAP

General Notes

PROJECT NOTES (CONT.)

SECTION 400

18. MEASURES FOR MAINTAINING PUBLIC TRAFFIC, SUCH AS TEMPORARY ROADS, DETOURS, RUN-AROUNDS, ETC, SHALL BE CONSTRUCTED UTILIZING THE APPLICABLE STANDARD BID ITEMS, NOT TEMPORARY ROADWAY MATERIAL ITEMS. TRIM IS INTENDED FOR MAINTAINING INGRESS AND EGRESS TO PROPERTIES OR BUSINESSES AS WELL AS MAINTENANCE OF EXISTING PUBLIC ROADWAYS. TRIM SHALL ALSO BE USED TO MAINTAIN DETOUR ROADS, ETC. AFTER THEIR INITIAL CONSTRUCTION.

19. PRIOR TO PLACEMENT OF ANY SECTION OF PCC PAVEMENT, THE UNDERLYING BASE COURSES OF SOIL CEMENT AND PERMEABLE TREATED BASE SHALL BE COMPLETED TO THEIR FULL WIDTH (OUTSIDE OF SHOULDER TO OUTSIDE OF SHOULDER) AND THE UNDERDRAIN AND UNDERDRAIN OUTLETS INSTALLED FOR THE ENTIRE SECTION OF PAVING BEING CONSIDERED BY THE CONTRACTOR.

20. THE CONTRACTOR SHALL SCHEDULE HIS WORK SO THAT ALL PERMEABLE TREATED BASE (PTB) PLACED DURING ANY ONE CONSTRUCTION SEASON IS COVERED WITH PCC OR WARM MIX PAVEMENT, AS APPLICABLE, BY THE END OF THE CONSTRUCTION SEASON. ANY PTB WHICH HAS NOT BEEN PAVED OVER AT THE END OF THE SEASON MUST BE ENTIRELY COVERED WITH POLYETHYLENE SHEETING, PROPERLY ANCHORED AND OVERLAPPED AT LEAST EIGHTEEN INCHES FOR THE WINTER AND UNTIL PAVING OPERATIONS RESUME. NO CONSTRUCTION TRAFFIC OF ANY KIND WILL BE PERMITTED TO TRAVERSE OVER PTB AT ANY TIME, EITHER UNCOVERED OR COVERED WITH POLYETHYLENE, EXCEPT FOR NECESSARY EQUIPMENT UTILIZED DURING PAVING OPERATIONS. THE COST OF FURNISHING, INSTALLING AND MAINTAINING THE POLYETHYLENE SHEETING SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR THE PTB.

21. EXCEPT FOR NECESSARY EQUIPMENT UTILIZED DURING PAVING OPERATIONS, NO CONSTRUCTION TRAFFIC OF ANY KIND SHALL BE PERMITTED TO RUN ON THE SOIL CEMENT BASE COURSE.

SECTION 600

22. THE DEPARTMENT AND THE CONTRACTOR SHALL REVIEW VIDEO INSPECTION OF ALL EXISTING PIPES AND DRAINAGE STRUCTURES TO BE USED IN THE FINAL DRAINAGE SYSTEM AND AGREE ON THE CONDITION PRIOR TO THE START OF CONSTRUCTION. EXISTING PIPES AND DRAINAGE STRUCTURES DAMAGED DUE TO CONTRACTOR OPERATIONS SHALL BE REPAIRED OR REPLACED IN-KIND AT THE CONTRACTOR'S EXPENSE. THE DEPARTMENT OR ITS REPRESENTATIVE WILL INSPECT NEW PIPE RUNS TO CONFIRM CONDITION PRIOR TO ACCEPTANCE.

23. ITEM 602002-P.C.C. MASONRY, CLASS B SHALL BE USED TO CONSTRUCT MISCELLANEOUS TYPES OF STRUCTURES SUCH AS PADS, BOLLARDS, ENCASEMENTS, ETC. AS DIRECTED BY THE ENGINEER UNLESS THE WORK IS TO BE PAID OTHERWISE AS INDICATED IN THE CONTRACT DOCUMENTS. THESE MISCELLANEOUS TYPES OF STRUCTURES ARE ANTICIPATED TO INVOLVE LESS THAN FIVE CUBIC YARDS PER SITE. THE VOLUME MEASURED FOR PAYMENT SHALL BE THE VOLUME OF P.C.C. MASONRY ACTUALLY PLACED TO CONSTRUCT THE MISCELLANEOUS STRUCTURE WITHIN THE LIMITS APPROVED BY THE ENGINEER. ALL COSTS ASSOCIATED WITH FURNISHING ALL LABOR, EQUIPMENT, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK INCLUDING CONCRETE, REINFORCING STEEL, EXCAVATION, BACKFILL, BACKFILLING, ETC. SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 602002 - P.C.C. MASONRY CLASS B.

24. DRAINAGE INLET(S) TO BE ATTACHED TO EXISTING PIPE(S) SHALL BE CAST IN PLACE. CAST IN PLACE CONSTRUCTION SHALL BE INCIDENTAL TO THE APPLICABLE BID ITEM FOR THE SUBJECT INLET.

SECTION 700

25. IN AREAS WHERE PROPOSED CURB MEETS EXISTING CURB AND THE TWO CURB TYPES ARE NOT SIMILAR, THE PROPOSED CURB SHALL BE TRANSITIONED IN 10 LINEAR FEET, UNLESS OTHERWISE DIRECTED BY THE ENGINEER. PAYMENT FOR THIS WORK, INCLUDING SAW CUTTING EXISTING CURB SHALL BE INCIDENTAL TO THE PROPOSED CURB ITEM.

26. PORTLAND CEMENT CONCRETE CHANNELIZING ISLANDS THAT ARE LESS THAN 75 SQ FT MAY BE POURED MONOLITHICALLY, OR AS DIRECTED BY THE ENGINEER.

27. STATION, OFFSET AND ELEVATION DATA GIVEN FOR DRAINAGE STRUCTURES ARE TO BE APPLIED TO THE CENTER OF THE GRATE ALONG THE FLOWLINE FOR INLETS, AND TO THE CENTER OF THE STRUCTURE FOR JUNCTION BOXES AND MANHOLES.

28. WHERE SPECIFIED ON THE PLANS, DRAINAGE INLET GRATES ADJACENT TO THE ROAD WHICH ARE NOT TYPE 1 SHALL BE REPLACED. THE ACTUAL LOCATIONS, THE NEED FOR ANY GRATE MODIFICATIONS OR FOR NEW FRAMES SHALL BE (DETERMINED) BY THE ENGINEER. ALL REPLACED GRATES/FRAMES SHALL BE DELIVERED TO THE NEAREST DISTRICT MAINTENANCE YARD WITH THE COST OF DELIVERY INCIDENTAL TO ITEM 708500 - REPLACING CATCH BASIN GRATES. FINAL PAYMENT FOR REPLACED GRATES/FRAMES SHALL NOT BE MADE UNTIL RECEIPT OF DELIVERED MATERIALS IS PRODUCED, SIGNED BY A DELDOT MAINTENANCE YARD SUPERVISOR.

29. ALL PAVED AREAS TO BE RECONSTRUCTED OR WIDENED SHALL BE SAWCUT AT THE POINT WHERE THE NEW PAVEMENT IS TO TIE INTO THE EXISTING PAVEMENT.

30. RAISED/RECESSED PAVEMENT MARKERS (RPMs) SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST EDITION OF THE MANUAL TITLED "DELAWARE DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR STREETS AND HIGHWAYS" (PART 3) AND THE LATEST RPM GUIDELINES. PAYMENT FOR RPM INSTALLATION SHALL BE MADE UNDER ITEM 736000 - RAISED/RECESSED PAVEMENT MARKERS.

31. ALL UNDERDRAIN OUTLETS, CATCH BASINS, PIPES, CONDUITS, [illegible] ETC. IN GUARDRAIL AREAS OR NEAR THEIR CONSTRUCTION YET TO BE PERFORMED SHALL BE VISIBLY MARKED BY THE CONTRACTOR PRIOR TO THE INSTALLATION IN ORDER TO AVOID FUTURE DAMAGE [illegible] OF THE GUARDRAIL POSTS) OR THE PERFORMANCE OF OTHER CONSTRUCTION. THE LOCATION OF GUARDRAIL POSTS OTHER CONSTRUCTION SHALL BE VERIFIED IN THE FIELD PRIOR TO PLACING THESE ITEMS. THE LOCATION OF THESE ITEMS SHALL BE ADJUSTED TO AVOID CONFLICTS WITH THE GUARDRAIL OR OTHER CONSTRUCTION. ALTERATIONS TO THE GUARDRAIL POST SPACING WILL NOT BE ALLOWED. [illegible] WORK REQUIRED TO RELOCATE THESE ITEMS DUE TO CONFLICTS WITH GUARDRAIL OR OTHER CONSTRUCTION SHALL BE [illegible] TO THE SATISFACTION OF THE ENGINEER AND SHALL BE AT THE CONTRACTOR'S EXPENSE, INCLUDING ANY REMOVAL AND REPLACEMENT OF PAVEMENT.

32. DELDOT OR ITS REPRESENTATIVE SHALL FURNISH AND INSTALL RIGHT-OF-WAY MONUMENTS AFTER THE COMPLETION OF THE PROJECT. LOCATIONS OF RIGHT-OF-WAY MONUMENTS ARE PROVIDED ON THE PLANS FOR INFORMATION ONLY.

33. THE LOCATION FOR ITEM 739506 - FIELD OFFICE, TYPE II,22 SPECIAL COMPLEX SHALL BE ON THE DELDOT OWNED PARCEL EAST OF US 13 AT APPROXIMATE SR 1 STATION 1832+00. SEE DRAWING GR-02.

34. THE COST OF ANY FLOODLIGHTING NECESSARY DUE TO WORK BY THE CONTRACTOR ON ANY ITEM OCCURRING AFTER [illegible] INCIDENTAL TO THE BID PRICE OF THE ITEM BEING CONSTRUCTED AFTER DARK. DURING ALL CONSTRUCTION, ALL PERSONS WITHIN THE WORK ZONE SHALL HAVE SAFETY WEAR IN ACCORDANCE WITH THE DEMUTCD.

35. [illegible] ERAGROSTIS CURVULA, OR CORONILLA VARIA [illegible] SECTION 734 - SEEDING HAS BEEN MODIFIED TO REMOVE [illegible] ERAGROSTIS CURVULA [illegible] CORONILLA VARIA.

36. INSTALLATION OF RIPRAP OUTLET PROTECTION (ITEMS 712005 AND 712006) SHALL BE IN ACCORDANCE WITH DIMENSIONS AND QUANTITIES INDICATED ON THE CONSTRUCTION PLANS. THE SPECIFIED DIMENSIONS ARE MINIMUM DIMENSIONS NECESSARY TO PROVIDE SUFFICIENT EROSION CONTROL. THE QUANTITY LISTED REPRESENTS THE SQUARE YARDAGE BASED UPON THE PLAN DEPICTION OF THE RIPRAP, DUE TO THE IRREGULAR CONFIGURATION OF SOME RIPRAP PADS, THE NOTED QUANTITY MAY NOT BE ACHIEVED BY A NOMINAL AMOUNT NOT TO EXCEED 5% LESS THAN THE NOTED QUANTITY. THE ENGINEER SHALL APPROVE ALL RIPRAP INSTALLATION. THE COST FOR SUPPLY AND INSTALLATION OF ALL STONE BEDDING BELOW PROPOSED RIPRAP SHALL BE INCIDENTAL TO THE ASSOCIATED RIPRAP ITEM.

PROJECT NOTES (CONT.)

SECTION 700 (CONT.)

37. ITEM 727000 - RIGHT-OF-WAY FENCE SHALL BE INSTALLED BY HAND IN SENSITIVE AREAS. SENSITIVE AREAS INCLUDE WOODS, WETLANDS, STREAMS, CULTURAL RESOURCE AREAS AND OTHER AREAS AS SHOWN ON THE PLANS AND AS DETERMINED BY THE ENGINEER. THERE SHALL BE NO VEHICLE ACCESS AND GRUBBING FOR THE PURPOSES OF INSTALLING RIGHT-OF-WAY FENCE IN SENSITIVE AREAS. CLEARING OF VEGETATION FOR THE PURPOSE OF INSTALLING RIGHT-OF-WAY FENCE SHALL BE KEPT TO A MINIMUM IN SENSITIVE AREAS. IF REMOVAL OF VEGETATION CANNOT BE AVOIDED, THE VEGETATION SHALL BE CUT FLUSH WITH THE GROUND SURFACE (I.E., NO DISTURBANCE OF THE ROOT MAT). HAND-MIXED CONCRETE SHALL BE USED FOR CONCRETE FOOTINGS IN SENSITIVE AREAS. POST SPACING SHALL BE ADJUSTED AS APPROVED BY THE ENGINEER TO COMPLY WITH THE MINIMUM AND MAXIMUM CLEARANCE OF THE BOTTOM OF THE FABRIC. NO EXCAVATION OR BACKFILLING OF THE EXISTING GROUND SHALL BE CONDUCTED TO COMPLY WITH THE MINIMUM AND MAXIMUM CLEARANCE OF THE BOTTOM OF FABRIC OVER GROUND IN SENSITIVE AREAS. EXCAVATIONS FOR POSTS AND FOOTERS WITHIN SENSITIVE AREAS THAT WILL BE USED FOR BACKFILLING OF THE POSTS AND FOOTERS SHALL BE PLACED ON PLASTIC AND ANY EXCESS EXCAVATIONS SHALL BE REMOVED AND DISPOSED OF IN NON-SENSITIVE AREAS AS APPROVED BY THE ENGINEER.

SECTION 900

38. THIS PROJECT IS COVERED UNDER AN NPDES GENERAL PERMIT FOR CONSTRUCTION. UNDER THE GENERAL PERMIT, COMPLIANCE WITH DELDOT'S APPROVED SEDIMENT AND STORMWATER MANAGEMENT PLANS WILL CONSTITUTE COMPLIANCE WITH THE NPDES INDUSTRIAL PERMITTING REQUIREMENTS FOR THIS CONSTRUCTION PROJECT. A COPY OF THE NPDES GENERAL PERMIT AND NOI IS KEPT ON FILE IN EACH OF THE CONSTRUCTION OFFICES AND THE DEPARTMENT'S STORMWATER SECTION. A COPY OF THE GENERAL PERMIT OR THE CAVEAN BE OBTAINED UPON REQUEST FROM EITHER THE DEPARTMENT'S STORMWATER ENGINEER OR THE APPROPRIATE CONSTRUCTION ENGINEER.

MISCELLANEOUS

39. THE CONTRACTOR SHALL CONTACT MICHAEL ELLER, THE CHIEF OF SCHEDULING FOR DART FIRST STATE, 14 DAYS PRIOR TO THE START OF CONSTRUCTION AT 302-576-6091.

40. ANY CHANGES TO OR DEVIATIONS FROM THESE PLANS REQUESTED BY THE CONTRACTOR MUST BE REVIEWED AND APPROVED BY THE ENGINEER AND ENVIRONMENTAL MONITOR PRIOR TO CONDUCTING ANY WORK. APPROVAL MAY TAKE A SIGNIFICANT AMOUNT OF TIME TO COMPLETE AND ALL CHANGES MAY NOT BE APPROVED. THE CONTRACTOR SHALL HAVE NO CLAIM AGAINST THE DEPARTMENT FOR COSTS OR DELAYS ASSOCIATED WITH THE APPROVAL OR REJECTION OF REQUESTED CHANGES OR DEVIATIONS FROM THESE PLANS.

41. RESTORATION OF TEMPORARY IMPACTS

A. PRIOR TO PERFORMING ANY WORK ASSOCIATED WITH TEMPORARY IMPACTS TO DELINEATED WETLANDS, THE CONTRACTOR SHALL STAKE THE LIMITS OF TEMPORARY DISTURBANCE WITHIN THE WETLANDS AND ALLOW 14 CALENDAR DAYS FOR DELDOT TO OBTAIN EXISTING TOPOGRAPHY SURVEY WITHIN THE TEMPORARY DISTURBANCE. THIS EXISTING SURFACE SHALL BE PROVIDED TO AND ACCEPTED BY THE CONTRACTOR BEFORE ANY WORK IS PERFORMED WITHIN THE WETLANDS. THE CONTRACTOR SHALL HAVE 5 CALENDAR DAYS TO RESPOND TO THE EXISTING SURFACE INFORMATION OR OTHERWISE IT SHALL BE CONSIDERED ACCEPTED. THE EXISTING SURFACE PLAN SHALL BE PROVIDED IN BOTH DIGITAL AND PAPER COPIES CONFORMING TO DELDOT CADD STANDARDS AT THE SAME SCALE AS THE CONTRACT PLANS.

B. UPON MUTUAL ACCEPTANCE OF THE EXISTING SURFACE TOPOGRAPHY PLAN, THE CONTRACTOR SHALL FIRST INSTALL THE RESOURCE PROTECTION FENCE, AND THEN INSTALL THE NECESSARY EROSION AND SEDIMENT CONTROL DEVICES AS SHOWN ON THE PLANS AND DIRECTED BY THE ENGINEER. THE AREA OF THE TEMPORARY DISTURBANCE MAY BE CLEARED OF VEGETATION AS NECESSARY. VEGETATION SHALL NOT BE GRUBBED, AND SHALL BE CUT FLUSH WITH THE GROUND (I.E., NO DISTURBANCE OF THE ROOT MAT).

C. INSTALL THE TEMPORARY ACCESS ROAD OR OTHER NEEDED TEMPORARY DISTURBANCE AS SHOWN ON THE PLANS OR APPROVED BY THE ENGINEER. GEOTEXTILE SHALL BE PLACED ON TOP OF THE EXISTING GROUND TO PROVIDE SEPARATION BETWEEN THE EXISTING GROUND AND ANY PLACED MATERIALS.

D. WHEN THE CONTRACTOR HAS COMPLETED THE WORK REQUIRING THE TEMPORARY WETLAND DISTURBANCE, ALL MATERIALS THAT WERE PLACED BY THE CONTRACTOR SHALL BE REMOVED IN THEIR ENTIRETY. ONCE ALL MATERIALS HAVE BEEN REMOVED, THE CONTRACTOR SHALL ALLOW 14 CALENDAR DAYS FOR DELDOT TO OBTAIN EXISTING SURFACE ELEVATIONS OF THE DISTURBANCE AREA FOLLOWING THE SAME PROCEDURE DESCRIBED ABOVE FOR OBTAINING ORIGINAL ELEVATIONS. THESE EXISTING SURFACE ELEVATIONS SHALL BE PROVIDED TO THE CONTRACTOR AND INCLUDE A PLAN SHOWING THE ELEVATION DIFFERENCES BETWEEN THE ORIGINAL AND EXISTING SURFACES.

E. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING THE TEMPORARY DISTURBED AREA TO ORIGINAL ELEVATIONS WITH A GRADING TOLERANCE OF PLUS OR MINUS 0.1 FEET. RESTORATION OF THE DISTURBED AREA SHALL BE ACCOMPLISHED IN THE FOLLOWING MANNER

i. TILL THE GROUND WITHIN THE DISTURBED AREA TO LOOSEN UP THE SOILS DUE TO COMPACTION DURING CONSTRUCTION IN ACCORDANCE WITH THE SPECIFICATIONS OF ITEM 202555 - SUBSOIL TILLAGE. MINIMUM VERTICAL TILLAGE DEPTH SHALL BE 24 INCHES AS MEASURED BY FIELD PERFORMANCE.

ii. PLACE TOPSOIL TO FILL (DEPRESSIONS TO) THE ORIGINAL GROUND ELEVATIONS. TOPSOIL SHALL BE THE TOP 9 INCHES OF SOIL OBTAINED FROM AN ACTIVE OR RECENTLY (LESS THAN TEN YEARS) FALLOW OR ABANDONED CROP PRODUCING FARM FIELD OF A SANDY LOAM WITH A MINIMUM OF 4% ORGANIC MATTER. MAXIMUM DEPTH OF A SINGLE LIFT OF TOPSOIL PLACED SHALL BE 6 INCHES AND SHALL BE PLACED IN ACCORDANCE WITH SECTION 730.

iii. DISK THE FINAL TOPSOIL SURFACE WITHIN THE DISTURBED AREA TO PREPARE THE AREA FOR SEED. USE A MINIMUM OF 3 PASSES OF A DISK USING LOW GROUND PRESSURE EQUIPMENT TO A MINIMUM DEPTH OF 4 INCHES.

iv. WHEN THE CONTRACTOR'S RESTORATION OF THE ORIGINAL ELEVATIONS HAS BEEN ACHIEVED, 7 CALENDAR DAYS SHALL BE ALLOWED FOR THE AREA TO AGAIN BE SURVEYED BY DELDOT UNDER THE SAME CONDITIONS DESCRIBED ABOVE AND THE ACCEPTANCE OF THE RESTORED ELEVATIONS WILL BE PROVIDED TO THE CONTRACTOR. DELDOT SHALL REVISE THE CONTRACTOR IF ADDITIONAL RESTORATION WORK IS REQUIRED AND THE CONTRACTOR SHALL ADDRESS THOSE AREAS AND ALLOW FOR 7 CALENDAR DAYS FOR NEW SURVEY INFORMATION TO BE OBTAINED UNTIL THE RESTORATION IS APPROVED BY DELDOT.

v. UPON ACCEPTANCE OF THE RESTORED ELEVATIONS, THE CONTRACTOR SHALL APPLY SEED TO THE DISTURBED WETLAND. SEEDING SHALL VARY BASED ON THE SLOPE TO BE SEEDED. ON SLOPES 5:1 OR FLATTER, SEEDING SHALL BE CONDUCTED UNDER ITEM 734552 - WET GROUND EROSION CONTROL GRASS SEEDING - FLATS. ON SLOPES GREATER THAN 5:1, SEEDING SHALL BE CONDUCTED UNDER ITEM 734013 - PERMANENT GRASS SEEDING, DRY GROUND.

[illegible] AREAS WITHIN THE LIMITS OF THE DELINEATED WETLANDS SHALL BE PLANTED IN ACCORDANCE WITH ITEM 737523 - PLANTING, SMOOTH ALDER SHALL BE PLANTED 10 FOOT ON CENTER ON SLOPES FLATTER THAN 5:1 AND SOUTHERN ARROWWOOD SHALL BE PLANTED 10 FOOT ON CENTER ON SLOPES STEEPER THAN 5:1. PLANTS SHALL BE INSTALLED DURING THE FIRST AVAILABLE PLANTING WINDOW PER THE STANDARD SPECIFICATIONS. SHRUBS SHALL NOT BE PLANTED UNDER BRIDGES. BEGIN SHRUB PLANTING 10 FEET OUTSIDE OF THE BRIDGE PARAPETS.

H. UPON FINAL ACCEPTANCE OF THE PLANTING, THE CONTRACTOR SHALL REMOVE THE RESOURCE PROTECTION FENCING AND THE EROSION AND SEDIMENT CONTROL MEASURES.

I. ALL COSTS FOR INSTALLING, REMOVING, AND RESTORING THE TEMPORARY WETLAND ACCESS SHALL BE INCLUDED IN THE LUMP SUM PRICE BID FOR ITEM 202508 - WETLAND ACCESS ROAD, TYPE II, WITH THE EXCEPTION OF THE RESOURCE PROTECTION FENCE, WHICH SHALL BE PAID UNDER ITEM 727552, AND THE REINFORCED SILT FENCE, WHICH SHALL BE PAID UNDER ITEM 251001. MAINTENANCE OF STREAM FLOW ASSOCIATED WITH THE WETLAND ACCESS ROAD, BRIDGE CONSTRUCTION AND ASSOCIATED ACTIVITIES TO BE PERFORMED IN WHOLE OR IN PART FROM THE WETLAND ACCESS ROAD, AND STREAM AND WETLAND RESTORATION ACTIVITIES SHALL BE INCIDENTAL TO THE WETLAND ACCESS ROAD, TYPE II.

PROJECT NOTES (CONT.)

MISCELLANEOUS (CONT.)

42. RESTORATION OF PERMANENT IMPACTS

A. PERMANENT IMPACTS TO CLEARED AND GRUBBED WETLANDS THAT HAVE NOT BEEN GRADED SHALL BE RESTORED WITH SEEDING AND SHRUB PLANTING AS INDICATED ON THE PLANS. SEEDING AND PLANTING SHALL BE CONDUCTED BETWEEN THE LIMITS OF GRADING AND THE LOC IN LOCATIONS DESIGNATED ON THE PLANS.

B. SEEDING SHALL VARY BASED ON SLOPE TO BE SEEDED. ON SLOPES 5:1 OR FLATTER, SEEDING SHALL BE PAID FOR AND CONDUCTED UNDER ITEM 734552 - WET GROUND EROSION CONTROL GRASS SEEDING - FLATS. ON SLOPES GREATER THAN 5:1 SEEDING SHALL PAID FOR AND CONDUCTED UNDER ITEM 734013 - PERMANENT GRASS SEEDING, DRY GROUND.

C. SHRUBS SHALL BE PLANTED IN THE PERMANENT IMPACT RESTORATION AREA. THE SHRUB PLANTING WILL VARY BASED ON SLOPE OF THE PLANTED AREA. ON SLOPES 5:1 OR FLATTER, SHRUB PLANTING SHALL CONSIST OF CONTAINERIZE 3 TO 5 FOOT TALL SMOOTH ALDER (ALNUS SERRULATA) LOCATED 10 FOOT ON CENTER. ON SLOPES GREATER THAN 5:1 SHRUB PLANTING SHALL CONSIST OF CONTAINERIZED 3 TO 5 FOOT TALL SOUTHERN ARROWWOOD (VIBURNUM DENTATUM) LOCATED 10 FOOT ON CENTER. PERMANENT IMPACT RESTORATION SHRUB PLANTING SHALL BE PAID FOR AND CONDUCTED UNDER ITEM 737523 - PLANTING.

43. IF GROWTH OF A NOXIOUS WEED AS DEFINED IN TITLE 3 OF THE DELAWARE CODE OR AS IDENTIFIED BY THE ENGINEER IS DETECTED WITHIN THE PROJECT LIMITS AS A RESULT OF USING ON-SITE MATERIALS, THE CONTRACTOR SHALL ERADICATE THE WEED USING ITEM 735001 HERBICIDE APPLICATION, NOXIOUS WEEDS. GROWTH OF NOXIOUS WEEDS RESULTING FROM THE CONTRACTOR'S FAILURE TO TEST FOR BRINGING MATERIALS TO THE PROJECT FROM OFF-SITE SOURCES SHALL BE ERADICATED AT THE CONTRACTOR'S EXPENSE.

44. THE CONTRACTOR SHALL FOLLOW ALL STATE AND LOCAL ORDINANCES CONCERNING CONSTRUCTION NOISE DURING THE DURATION OF THE CONSTRUCTION ACTIVITIES.

45. EXCAVATION WITHIN WOODED AREAS SHALL BE INCIDENTAL TO ITEM 201000 - CLEARING AND GRUBBING FOR A DEPTH OF 2 FEET BELOW THE EXISTING GRADE WITHIN THE ROADWAY FOOTPRINT OR STORMWATER MANAGEMENT FACILITY FOOTPRINT. ALL OTHER EXCAVATION SHALL BE PAID FOR UNDER ITEM 202000 - EXCAVATION AND EMBANKMENT.

RIGHT-OF-WAY MONUMENT SCHEDULE

NO.	STATION	OFFSET	NORTHING	EASTING
1	1015+00, 14	145, 71	557558, 9940	590088, 9694
2	1015+20, 00	385, 00	557680, 2870	589878, 1085
3	1011+50, 00	385, 00	557981, 9571	589956, 9405
4	1009+81, 26	175, 00	558099, 3107	590186, 3460
5	1007+00, 00	175, 00	558374, 4563	590213, 4396
6	1006+00, 00	87, 37	558465, 8979	590308, 6433
7	851+50, 00	176, 91	556403, 7354	589971, 5255
8	851+50, 00	148, 00	556426, 3170	589953, 4759
9	151+50, 00	-72, 00	557380, 1943	590570, 3602
10	156+50, 00	-47, 00	557930, 0071	590599, 1854
11	159+26, 77	-47, 00	558206, 7668	590601, 1106
12	162+76, 00	-47, 00	558556, 8712	590606, 2107
13	172+00, 00	-47, 00	559480, 4485	590626, 7158
14	173+25, 00	-70, 78	559805, 8924	590610, 1513

DESIGN DESIGNATION – RAMP R

FUNCTIONAL CLASS: N/A		D.H.V. PROJECTED: 1,200	YEAR: 2030
TYPE OF CONSTRUCTION: NEW CONSTRUCTION		DESIGN SPEED: 50 M.P.H.	
A.A.D.T. CURRENT: N/A	YEAR: N/A	TRUCKS: 6%	
A.A.D.T. PROJECTED: 14,000	YEAR: 2030	DIRECTION OF DISTRIBUTION: N/A	

DESIGN DESIGNATION – US 13 (N22)

FUNCTIONAL CLASS: MINOR ARTERIAL		D.H.V. PROJECTED: 4,270	YEAR: 2030
TYPE OF CONSTRUCTION: RESURFACING		DESIGN SPEED: 65 M.P.H.	
A.A.D.T. CURRENT: 24,318	YEAR: 2008	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 43,600	YEAR: 2030	DIRECTION OF DISTRIBUTION: 50 %	

DESIGN DESIGNATION – SR 1 (N83)

FUNCTIONAL CLASS: OTHER PRINCIPAL ARTERIAL		D.H.V. PROJECTED: 8,850	YEAR: 2030
TYPE OF CONSTRUCTION: WIDENING		DESIGN SPEED: 70 M.P.H.	
A.A.D.T. CURRENT: 71,019	YEAR: 2008	TRUCKS: 13 %	
A.A.D.T. PROJECTED: 110,000	YEAR: 2030	DIRECTION OF DISTRIBUTION: 50 %	

FOR DESIGN DESIGNATION – RAMP Q AND DESIGN DESIGNATION – US 301 NB RAMP SEE DESIGN DESIGNATION – US 301 ON THE TITLE SHEET

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS: REVISED NOTES BRT/DMG	NOT TO SCALE	US 301 & SR 1 INTERCHANGE	CONTRACT: T200911302	BRIDGE NO.
				COUNTY: NEW CASTLE	DESIGNED BY: SJB
					DRAWN BY: TAO
				NOTES	

PM-02

SHEET NO.	TOTAL SHTS.
7	491

2/27/2018 2:08:05 PM

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Some More Interesting Notes

RIGHT–OF–WAY MONUMENT SCHEDULE				
NO.	STATION	OFFSET	NORTHING	EASTING
1	1015+69.14	145.71	557558.9940	590088.9694
2	1015+20.00	385.00	557680.2870	589878.1085
3	1011+50.00	385.00	557981.9571	589956.9405
4	1009+81.26	175.00	558099.3107	590186.3460
5	1007+00.00	175.00	558374.4565	590213.4396
6	1006+00.00	87.37	558465.8978	590308.6433
7	851+50.00	176.91	556403.7354	589971.5255
8	851+50.00	148.00	556426.3170	589953.4759
9	151+50.00	-72.00	557380.1943	590570.3602
10	156+50.00	-47.00	557930.0071	590599.1854
11	159+26.77	-47.00	558206.7668	590601.1106
12	162+76.00	-47.00	558556.6712	590606.2107
13	172+00.00	-47.00	559480.4485	590626.7158
14	175+25.00	-70.78	559805.8924	590610.1513

33. THE LOCATION FOR ITEM 759506 - FIELD OFFICE, TYPE II.22 SPECIAL COMPLEX SHALL BE ON THE DELDOT OWNED PARCEL EAST OF US 13 AT APPROXIMATE SR 1 STATION 1832+00. SEE DRAWING GR-02.

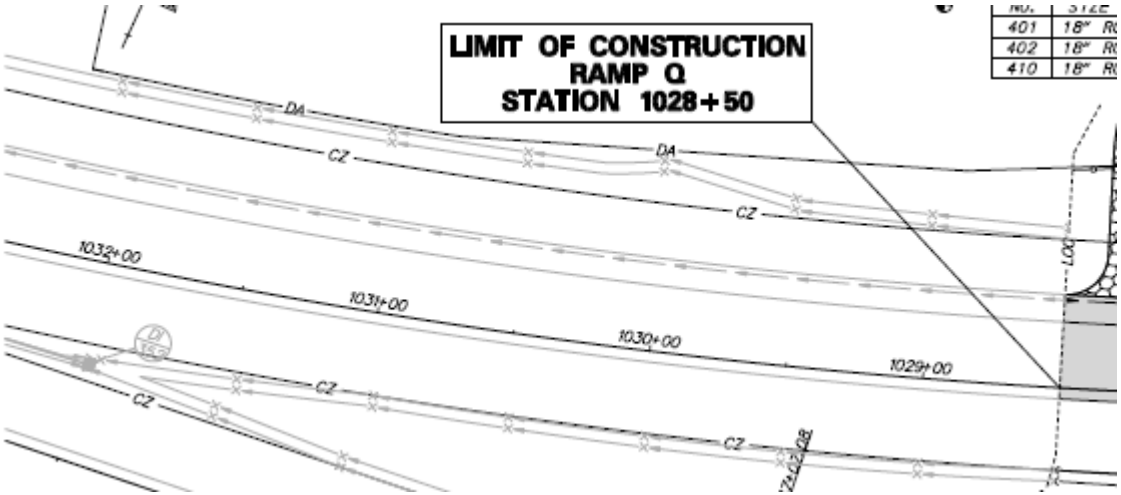
DESIGN DESIGNATION – RAMP R			
FUNCTIONAL CLASS: N/A		D.H.V. PROJECTED: 1,200	YEAR: 2030
TYPE OF CONSTRUCTION: NEW CONSTRUCITON		DESIGN SPEED: 50 M.P.H.	
A.A.D.T. CURRENT: N/A	YEAR: N/A	TRUCKS: 6%	
A.A.D.T. PROJECTED: 14,000	YEAR: 2030	DIRECTION OF DISTRIBUTION: N/A	
DESIGN DESIGNATION – US 13 (N22)			
FUNCTIONAL CLASS: MINOR ARTERIAL		D.H.V. PROJECTED: 4,275	YEAR: 2030
TYPE OF CONSTRUCTION: REALIGNMENT		DESIGN SPEED: 65 M.P.H.	
A.A.D.T. CURRENT: 24,318	YEAR: 2008	TRUCKS: 7 %	
A.A.D.T. PROJECTED: 43,600	YEAR: 2030	DIRECTION OF DISTRIBUTION: 50 %	
DESIGN DESIGNATION – SR 1 (N83)			
FUNCTIONAL CLASS: OTHER PRINCIPAL ARTERIAL		D.H.V. PROJECTED: 8,950	YEAR: 2030
TYPE OF CONSTRUCTION: WIDENING		DESIGN SPEED: 70 M.P.H.	
A.A.D.T. CURRENT: 71,024	YEAR: 2008	TRUCKS: 13 %	
A.A.D.T. PROJECTED: 110,000	YEAR: 2030	DIRECTION OF DISTRIBUTION: 50 %	

FOR DESIGN DESIGNATION – RAMP Q AND DESIGN DESIGNATION – US 301 NB RAMP, SEE DESIGN DESIGNATION – US 301 ON THE TITLE SHEET

Delaware T²/LTAP

Stationing

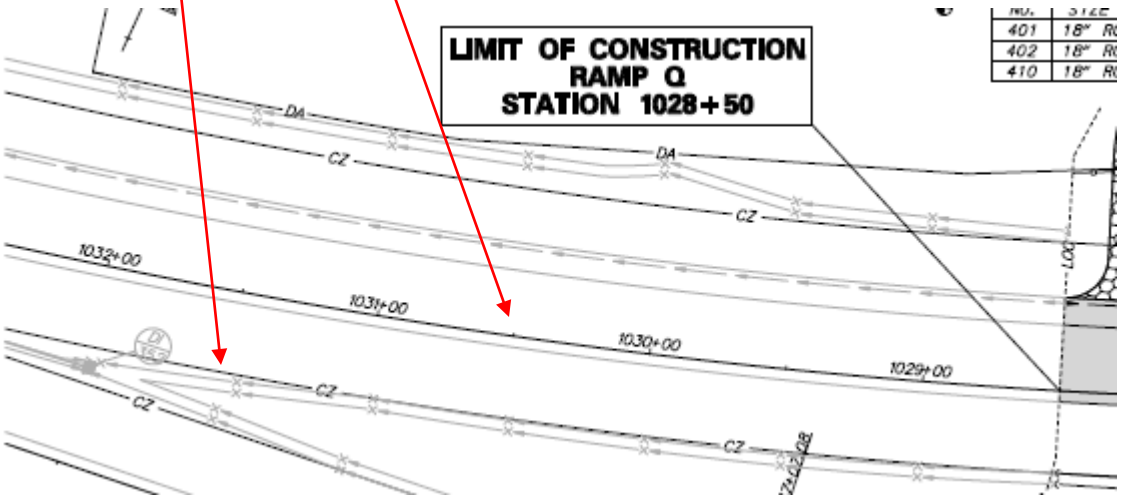
- Sta. 1276 + 53.25 – what's that all about?
- It's our horizontal location system
- Runs along a baseline – often the road centerline



Delaware T²/LTAP

Stationing

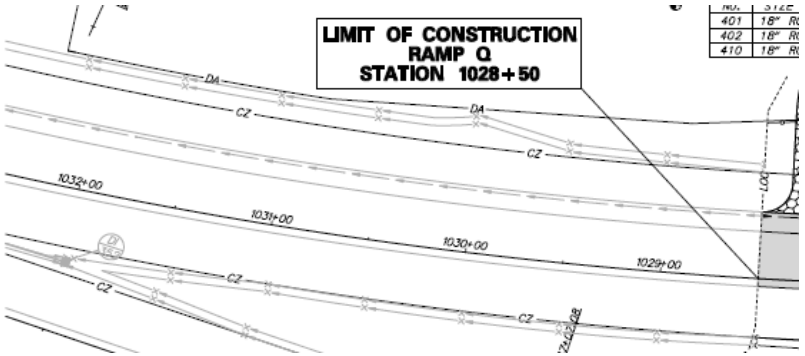
- Sta. 1030 + 50.00
- Sta. 1031 + 50.00 offset -24.75’
- Clear as mud, right?



Delaware T²/LTAP

Stationing

- "Station:" 100' along baseline

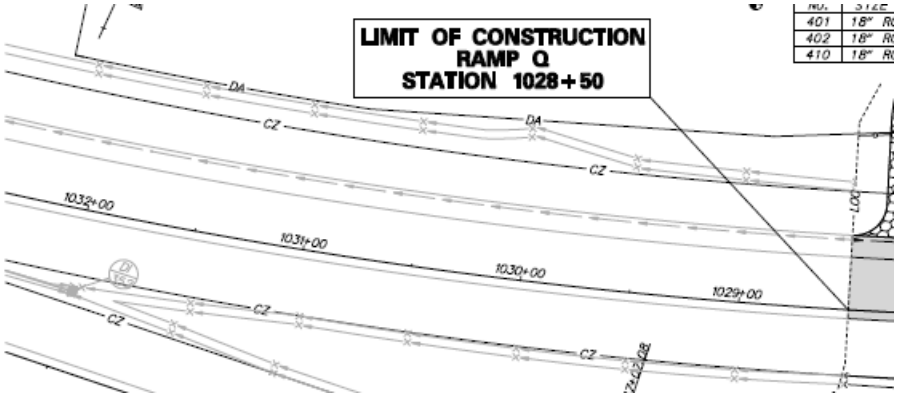


- Two points
  - Sta. 1030 + 00.00 and Sta. 1031 + 00.00: 100'
  - Sta. 1030 + 00.00 and Sta. 1031 + 75.25: 175.25'
  - Sta. 1030 + 22.67 and Sta. 1037 + 72.33: 749.66'
    - 103772.33 – 103022.67 = 749.66

Delaware T²/LTAP

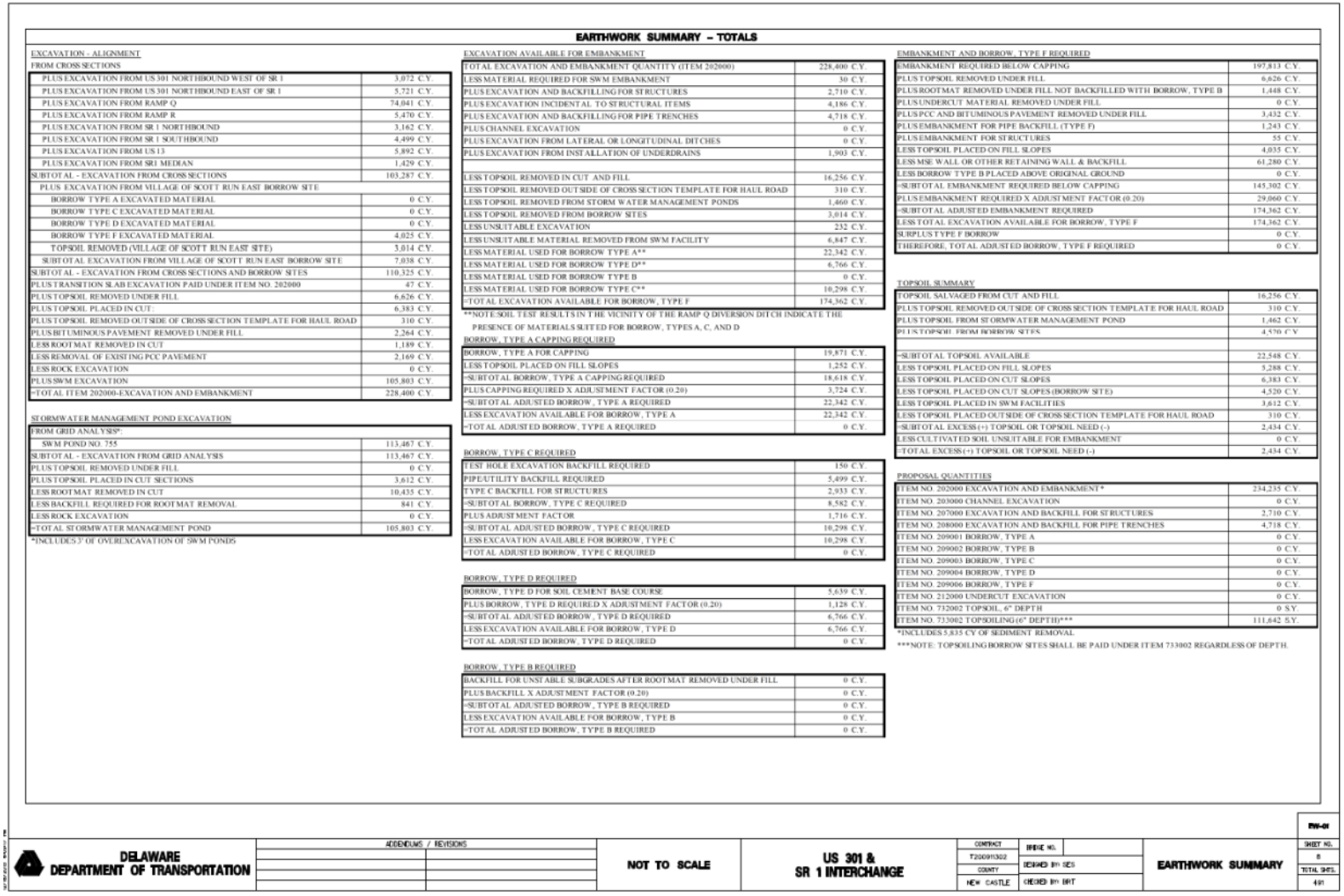
Stationing

- "Offset:" distance perpendicular to baseline
- Left or right, plus or minus
  - Sta. 1030 + 00.00 offset -12.75'
    - 12.75' left of that station point, looking "up station"
  - Sta. 1031 + 75.25 RT 22.33'
    - 22.33' right of that station point, looking "up stream"



Delaware T²/LTAP

Earthwork Quantities



EARTHWORK SUMMARY – TOTALS

EXCAVATION - ALIGNMENT

FROM CROSS SECTIONS

PLUS EXCAVATION FROM US 301 NORTHBOUND WEST OF SR 1	3,072 C.Y.
PLUS EXCAVATION FROM US 301 NORTHBOUND EAST OF SR 1	5,721 C.Y.
PLUS EXCAVATION FROM RAMP Q	74,041 C.Y.
PLUS EXCAVATION FROM RAMP R	5,470 C.Y.
PLUS EXCAVATION FROM SR 1 NORTHBOUND	3,162 C.Y.
PLUS EXCAVATION FROM SR 1 SOUTHBOUND	4,499 C.Y.
PLUS EXCAVATION FROM US 13	5,892 C.Y.
PLUS EXCAVATION FROM SR1 MEDIAN	1,429 C.Y.
SUBTOTAL - EXCAVATION FROM CROSS SECTIONS	103,287 C.Y.
PLUS EXCAVATION FROM VILLAGE OF SCOTT RUN EAST BORROW SITE	
BORROW TYPE A EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE C EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE D EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE F EXCAVATED MATERIAL	4,025 C.Y.
TOPSOIL REMOVED (VILLAGE OF SCOTT RUN EAST SITE)	3,014 C.Y.
SUBTOTAL EXCAVATION FROM VILLAGE OF SCOTT RUN EAST BORROW SITE	7,038 C.Y.
SUBTOTAL - EXCAVATION FROM CROSS SECTIONS AND BORROW SITES	110,325 C.Y.
PLUS TRANSITION SLAB EXCAVATION PAID UNDER ITEM NO. 202000	47 C.Y.
PLUS TOPSOIL REMOVED UNDER FILL	6,626 C.Y.
PLUS TOPSOIL PLACED IN CUT:	6,383 C.Y.
PLUS TOPSOIL REMOVED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
PLUS BITUMINOUS PAVEMENT REMOVED UNDER FILL	2,264 C.Y.
LESS ROOT MAT REMOVED IN CUT	1,189 C.Y.
LESS REMOVAL OF EXISTING PCC PAVEMENT	2,169 C.Y.
LESS ROCK EXCAVATION	0 C.Y.
PLUS SWM EXCAVATION	105,803 C.Y.
=TOTAL ITEM 202000-EXCAVATION AND EMBANKMENT	228,400 C.Y.

STORMWATER MANAGEMENT POND EXCAVATION

FROM GRID ANALYSIS*:	
SWM POND NO. 755	113,467 C.Y.
SUBTOTAL - EXCAVATION FROM GRID ANALYSIS	113,467 C.Y.
PLUS TOPSOIL REMOVED UNDER FILL	0 C.Y.
PLUS TOPSOIL PLACED IN CUT SECTIONS	3,612 C.Y.
LESS ROOT MAT REMOVED IN CUT	10,435 C.Y.
LESS BACKFILL REQUIRED FOR ROOT MAT REMOVAL	841 C.Y.
LESS ROCK EXCAVATION	0 C.Y.
=TOTAL STORMWATER MANAGEMENT POND	105,803 C.Y.

*INCLUDES 3' OF OVEREXCAVATION OF SWM PONDS

EXCAVATION AVAILABLE FOR EMBANKMENT

TOTAL EXCAVATION AND EMBANKMENT QUANTITY (ITEM 202000)	228,400 C.Y.
LESS MATERIAL REQUIRED FOR SWM EMBANKMENT	30 C.Y.
PLUS EXCAVATION AND BACKFILLING FOR STRUCTURES	2,710 C.Y.
PLUS EXCAVATION INCIDENTAL TO STRUCTURAL ITEMS	4,186 C.Y.
PLUS EXCAVATION AND BACKFILLING FOR PIPE TRENCHES	4,718 C.Y.
PLUS CHANNEL EXCAVATION	0 C.Y.
PLUS EXCAVATION FROM LATERAL OR LONGITUDINAL DITCHES	0 C.Y.
PLUS EXCAVATION FROM INSTALLATION OF UNDERDRAINS	1,903 C.Y.
LESS TOPSOIL REMOVED IN CUT AND FILL	16,256 C.Y.
LESS TOPSOIL REMOVED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
LESS TOPSOIL REMOVED FROM STORM WATER MANAGEMENT PONDS	1,460 C.Y.
LESS TOPSOIL REMOVED FROM BORROW SITES	3,014 C.Y.
LESS UNSUITABLE EXCAVATION	232 C.Y.
LESS UNSUITABLE MATERIAL REMOVED FROM SWM FACILITY	6,847 C.Y.
LESS MATERIAL USED FOR BORROW TYPE A**	22,342 C.Y.
LESS MATERIAL USED FOR BORROW TYPE D**	6,766 C.Y.
LESS MATERIAL USED FOR BORROW TYPE B	0 C.Y.
LESS MATERIAL USED FOR BORROW TYPE C**	10,298 C.Y.
=TOTAL EXCAVATION AVAILABLE FOR BORROW, TYPE F	174,362 C.Y.

**NOTE: SOIL TEST RESULTS IN THE VICINITY OF THE RAMP Q DIVERSION DITCH INDICATE THE PRESENCE OF MATERIALS SUITED FOR BORROW, TYPES A, C, AND D

BORROW, TYPE A CAPPING REQUIRED

BORROW, TYPE A FOR CAPPING	19,871 C.Y.
LESS TOPSOIL PLACED ON FILL SLOPES	1,252 C.Y.
=SUBTOTAL BORROW, TYPE A CAPPING REQUIRED	18,618 C.Y.
PLUS CAPPING REQUIRED X ADJUSTMENT FACTOR (0.20)	3,724 C.Y.
=SUBTOTAL ADJUSTED BORROW, TYPE A REQUIRED	22,342 C.Y.
LESS EXCAVATION AVAILABLE FOR BORROW, TYPE A	22,342 C.Y.
=TOTAL ADJUSTED BORROW, TYPE A REQUIRED	0 C.Y.

BORROW, TYPE C REQUIRED

TEST HOLE EXCAVATION BACKFILL REQUIRED	150 C.Y.
PIPE/UTILITY BACKFILL REQUIRED	5,499 C.Y.
TYPE C BACKFILL FOR STRUCTURES	2,933 C.Y.
=SUBTOTAL BORROW, TYPE C REQUIRED	8,582 C.Y.
PLUS ADJUSTMENT FACTOR	1,716 C.Y.
=SUBTOTAL ADJUSTED BORROW, TYPE C REQUIRED	10,298 C.Y.
LESS EXCAVATION AVAILABLE FOR BORROW, TYPE C	10,298 C.Y.
=TOTAL ADJUSTED BORROW, TYPE C REQUIRED	0 C.Y.

BORROW, TYPE D REQUIRED

BORROW, TYPE D FOR SOIL CEMENT BASE COURSE	5,639 C.Y.
PLUS BORROW, TYPE D REQUIRED X ADJUSTMENT FACTOR (0.20)	1,128 C.Y.
=SUBTOTAL ADJUSTED BORROW, TYPE D REQUIRED	6,766 C.Y.
LESS EXCAVATION AVAILABLE FOR BORROW, TYPE D	6,766 C.Y.
=TOTAL ADJUSTED BORROW, TYPE D REQUIRED	0 C.Y.

BORROW, TYPE B REQUIRED

BACKFILL FOR UNSTABLE SUBGRADES AFTER ROOT MAT REMOVED UNDER FILL	0 C.Y.
PLUS BACKFILL X ADJUSTMENT FACTOR (0.20)	0 C.Y.
=SUBTOTAL ADJUSTED BORROW, TYPE B REQUIRED	0 C.Y.
LESS EXCAVATION AVAILABLE FOR BORROW, TYPE B	0 C.Y.
=TOTAL ADJUSTED BORROW, TYPE B REQUIRED	0 C.Y.

EMBANKMENT AND BORROW, TYPE F REQUIRED

EMBANKMENT REQUIRED BELOW CAPPING	197,813 C.Y.
PLUS TOPSOIL REMOVED UNDER FILL	6,626 C.Y.
PLUS ROOT MAT REMOVED UNDER FILL NOT BACKFILLED WITH BORROW, TYPE B	1,448 C.Y.
PLUS UNDERCUT MATERIAL REMOVED UNDER FILL	0 C.Y.
PLUS PCC AND BITUMINOUS PAVEMENT REMOVED UNDER FILL	3,432 C.Y.
PLUS EMBANKMENT FOR PIPE BACKFILL (TYPE F)	1,243 C.Y.
PLUS EMBANKMENT FOR STRUCTURES	55 C.Y.
LESS TOPSOIL PLACED ON FILL SLOPES	4,035 C.Y.
LESS MSE WALL OR OTHER RETAINING WALL & BACKFILL	61,280 C.Y.
LESS BORROW TYPE B PLACED ABOVE ORIGINAL GROUND	0 C.Y.
=SUBTOTAL EMBANKMENT REQUIRED BELOW CAPPING	145,302 C.Y.
PLUS EMBANKMENT REQUIRED X ADJUSTMENT FACTOR (0.20)	29,060 C.Y.
=SUBTOTAL ADJUSTED EMBANKMENT REQUIRED	174,362 C.Y.
LESS TOTAL EXCAVATION AVAILABLE FOR BORROW, TYPE F	174,362 C.Y.
SURPLUS TYPE F BORROW	0 C.Y.
THEREFORE, TOTAL ADJUSTED BORROW, TYPE F REQUIRED	0 C.Y.

TOPSOIL SUMMARY

TOPSOIL SALVAGED FROM CUT AND FILL	16,256 C.Y.
PLUS TOPSOIL REMOVED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
PLUS TOPSOIL FROM STORMWATER MANAGEMENT POND	1,462 C.Y.
PLUS TOPSOIL FROM BORROW SITES	4,570 C.Y.
=SUBTOTAL TOPSOIL AVAILABLE	22,548 C.Y.
LESS TOPSOIL PLACED ON FILL SLOPES	5,288 C.Y.
LESS TOPSOIL PLACED ON CUT SLOPES	6,383 C.Y.
LESS TOPSOIL PLACED ON CUT SLOPES (BORROW SITE)	4,520 C.Y.
LESS TOPSOIL PLACED IN SWM FACILITIES	3,612 C.Y.
LESS TOPSOIL PLACED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
=SUBTOTAL EXCESS (+) TOPSOIL OR TOPSOIL NEED (-)	2,434 C.Y.
LESS CULTIVATED SOIL UNSUITABLE FOR EMBANKMENT	0 C.Y.
=TOTAL EXCESS (+) TOPSOIL OR TOPSOIL NEED (-)	2,434 C.Y.

PROPOSAL QUANTITIES

ITEM NO. 202000 EXCAVATION AND EMBANKMENT*	234,235 C.Y.
ITEM NO. 203000 CHANNEL EXCAVATION	0 C.Y.
ITEM NO. 207000 EXCAVATION AND BACKFILL FOR STRUCTURES	2,710 C.Y.
ITEM NO. 208000 EXCAVATION AND BACKFILL FOR PIPE TRENCHES	4,718 C.Y.
ITEM NO. 209001 BORROW, TYPE A	0 C.Y.
ITEM NO. 209002 BORROW, TYPE B	0 C.Y.
ITEM NO. 209003 BORROW, TYPE C	0 C.Y.
ITEM NO. 209004 BORROW, TYPE D	0 C.Y.
ITEM NO. 209006 BORROW, TYPE F	0 C.Y.
ITEM NO. 212000 UNDERCUT EXCAVATION	0 C.Y.
ITEM NO. 732002 TOPSOIL, 6" DEPTH	0 S.Y.
ITEM NO. 733002 TOPSOILING (6" DEPTH)***	111,642 S.Y.

*INCLUDES 5,835 CY OF SEDIMENT REMOVAL

***NOTE: TOPSOILING BORROW SITES SHALL BE PAID UNDER ITEM 733002 REGARDLESS OF DEPTH.

DELAWARE DEPARTMENT OF TRANSPORTATION	ADDENDUMS / REVISIONS	NOT TO SCALE	US 301 & SR 1 INTERCHANGE	CONTRACT T200911302	BRIDGE NO.	EARTHWORK SUMMARY
				COUNTY NEW CASTLE	DESIGNED BY SES	SHEET NO. 8
					CHECKED BY DRT	TOTAL SHTS. 491

Delaware T²/LTAP

Earthwork Quantities

EARTHWORK SUMMARY – TOTALS

EXCAVATION - ALIGNMENT

FROM CROSS SECTIONS

PLUS EXCAVATION FROM US 301 NORTHBOUND WEST OF SR 1	3,072 C.Y.
PLUS EXCAVATION FROM US 301 NORTHBOUND EAST OF SR 1	5,721 C.Y.
PLUS EXCAVATION FROM RAMP Q	74,041 C.Y.
PLUS EXCAVATION FROM RAMP R	5,470 C.Y.
PLUS EXCAVATION FROM SR 1 NORTHBOUND	3,162 C.Y.
PLUS EXCAVATION FROM SR 1 SOUTHBOUND	4,499 C.Y.
PLUS EXCAVATION FROM US 13	5,892 C.Y.
PLUS EXCAVATION FROM SR1 MEDIAN	1,429 C.Y.
SUBTOTAL - EXCAVATION FROM CROSS SECTIONS	103,287 C.Y.
PLUS EXCAVATION FROM VILLAGE OF SCOTT RUN EAST BORROW SITE	
BORROW TYPE A EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE C EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE D EXCAVATED MATERIAL	0 C.Y.
BORROW TYPE F EXCAVATED MATERIAL	4,025 C.Y.
TOPSOIL REMOVED (VILLAGE OF SCOTT RUN EAST SITE)	3,014 C.Y.
SUBTOTAL EXCAVATION FROM VILLAGE OF SCOTT RUN EAST BORROW SITE	7,038 C.Y.
SUBTOTAL - EXCAVATION FROM CROSS SECTIONS AND BORROW SITES	110,325 C.Y.
PLUS TRANSITION SLAB EXCAVATION PAID UNDER ITEM NO. 202000	47 C.Y.
PLUS TOPSOIL REMOVED UNDER FILL	6,626 C.Y.
PLUS TOPSOIL PLACED IN CUT:	6,383 C.Y.
PLUS TOPSOIL REMOVED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
PLUS BITUMINOUS PAVEMENT REMOVED UNDER FILL	2,264 C.Y.
LESS ROOTMAT REMOVED IN CUT	1,189 C.Y.
LESS REMOVAL OF EXISTING PCC PAVEMENT	2,169 C.Y.
LESS ROCK EXCAVATION	0 C.Y.
PLUS SWM EXCAVATION	105,803 C.Y.
=TOTAL ITEM 202000-EXCAVATION AND EMBANKMENT	228,400 C.Y.

EXCAVATION AVAILABLE FOR EMBANKMENT

TOTAL EXCAVATION AND EMBANKMENT QUANTITY (ITEM 202000)	228,400 C.Y.
LESS MATERIAL REQUIRED FOR SWM EMBANKMENT	30 C.Y.
PLUS EXCAVATION AND BACKFILLING FOR STRUCTURES	2,710 C.Y.
PLUS EXCAVATION INCIDENTAL TO STRUCTURAL ITEMS	4,186 C.Y.
PLUS EXCAVATION AND BACKFILLING FOR PIPE TRENCHES	4,718 C.Y.
PLUS CHANNEL EXCAVATION	0 C.Y.
PLUS EXCAVATION FROM LATERAL OR LONGITUDINAL DITCHES	0 C.Y.
PLUS EXCAVATION FROM INSTALLATION OF UNDERDRAINS	1,903 C.Y.
LESS TOPSOIL REMOVED IN CUT AND FILL	16,256 C.Y.
LESS TOPSOIL REMOVED OUTSIDE OF CROSS SECTION TEMPLATE FOR HAUL ROAD	310 C.Y.
LESS TOPSOIL REMOVED FROM STORM WATER MANAGEMENT PONDS	1,460 C.Y.
LESS TOPSOIL REMOVED FROM BORROW SITES	3,014 C.Y.
LESS UNSUITABLE EXCAVATION	232 C.Y.
LESS UNSUITABLE MATERIAL REMOVED FROM SWM FACILITY	6,847 C.Y.
LESS MATERIAL USED FOR BORROW TYPE A**	22,342 C.Y.
LESS MATERIAL USED FOR BORROW TYPE D**	6,766 C.Y.
LESS MATERIAL USED FOR BORROW TYPE B	0 C.Y.
LESS MATERIAL USED FOR BORROW TYPE C**	10,298 C.Y.
=TOTAL EXCAVATION AVAILABLE FOR BORROW, TYPE F	174,362 C.Y.

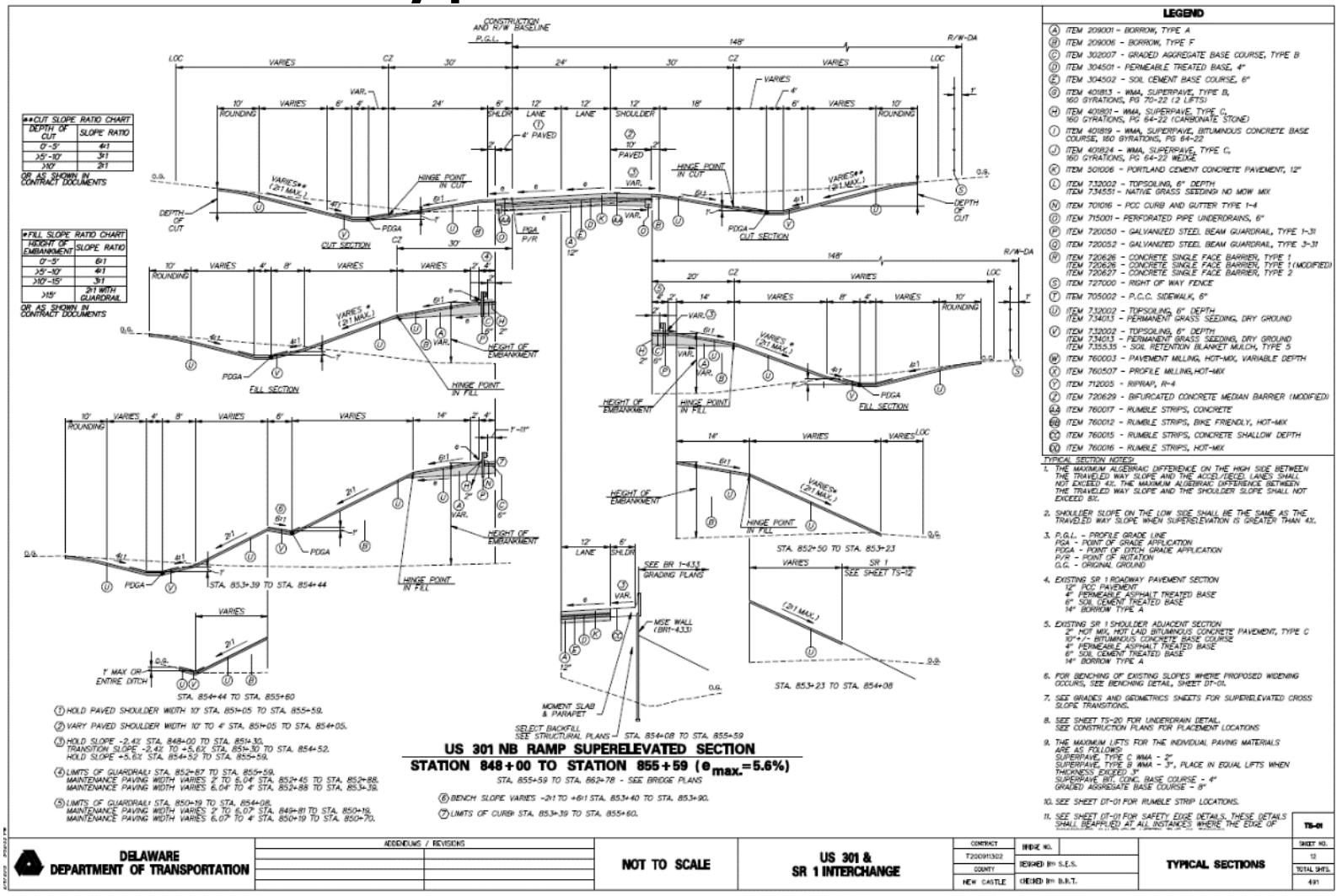
**NOTE:SOIL TEST RESULTS IN THE VICINITY OF THE RAMP Q DIVERSION DITCH INDICATE THE PRESENCE OF MATERIALS SUITED FOR BORROW, TYPES A, C, AND D

BORROW, TYPE A CAPPING REQUIRED

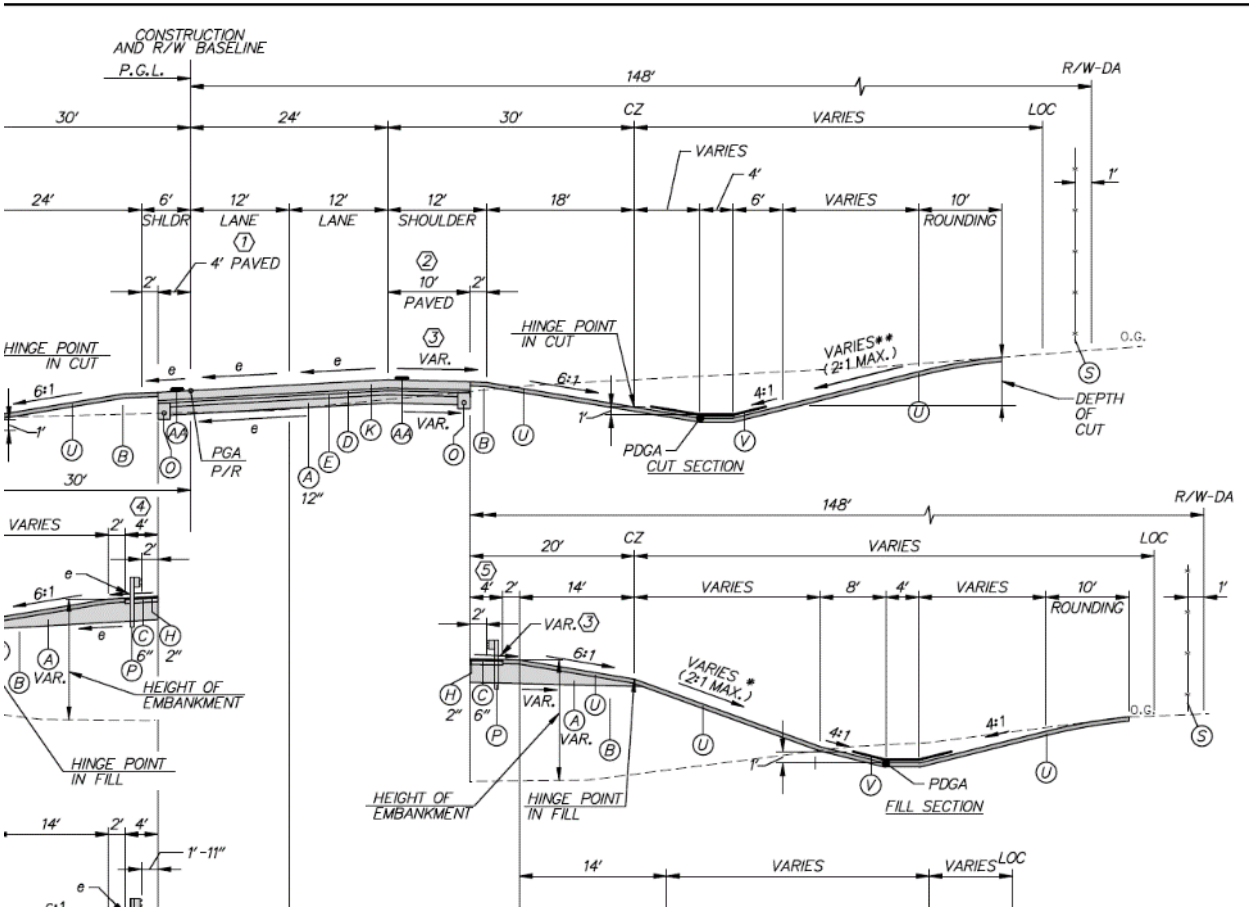
BORROW, TYPE A FOR CAPPING	19,871 C.Y.
LESS TOPSOIL PLACED ON FILL SLOPES	1,252 C.Y.
=SUBTOTAL BORROW, TYPE A CAPPING REQUIRED	18,618 C.Y.
PLUS CAPPING REQUIRED X ADJUSTMENT FACTOR (0.20)	3,724 C.Y.
=SUBTOTAL ADJUSTED BORROW, TYPE A REQUIRED	22,342 C.Y.

Delaware T²/LTAP

Typical Sections



Typical Sections



LEGEND

- (A) ITEM 209001 - BORROW, TYPE A
- (B) ITEM 209006 - BORROW, TYPE F
- (C) ITEM 302007 - GRADED AGGREGATE BASE COURSE, TYPE B
- (D) ITEM 304501 - PERMEABLE TREATED BASE, 4"
- (E) ITEM 304502 - SOIL CEMENT BASE COURSE, 6"
- (G) ITEM 401813 - WMA, SUPERPAVE, TYPE B, 160 GYRATIONS, PG 70-22 (2 LIFTS)
- (H) ITEM 401801 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22 (CARBONATE STONE)
- (I) ITEM 401819 - WMA, SUPERPAVE, BITUMINOUS CONCRETE BASE COURSE, 160 GYRATIONS, PG 64-22
- (J) ITEM 401824 - WMA, SUPERPAVE, TYPE C, 160 GYRATIONS, PG 64-22 WEDGE
- (K) ITEM 501006 - PORTLAND CEMENT CONCRETE PAVEMENT, 12"
- (L) ITEM 732002 - TOPSOILING, 6" DEPTH
  ITEM 734551 - NATIVE GRASS SEEDING: NO MOW MIX
- (N) ITEM 701016 - PCC CURB AND GUTTER TYPE 1-4
- (O) ITEM 715001 - PERFORATED PIPE UNDERDRAINS, 6"
- (P) ITEM 720050 - GALVANIZED STEEL BEAM GUARDRAIL, TYPE 1-31
- (Q) ITEM 720052 - GALVANIZED STEEL BEAM GUARDRAIL, TYPE 3-31
- (R) ITEM 720626 - CONCRETE SINGLE FACE BARRIER, TYPE 1
  ITEM 720626 - CONCRETE SINGLE FACE BARRIER, TYPE 1 (MODIFIED)
  ITEM 720627 - CONCRETE SINGLE FACE BARRIER, TYPE 2
- (S) ITEM 727000 - RIGHT OF WAY FENCE
- (T) ITEM 705002 - P.C.C. SIDEWALK, 6"
- (U) ITEM 732002 - TOPSOILING, 6" DEPTH
  ITEM 734013 - PERMANENT GRASS SEEDING, DRY GROUND
- (V) ITEM 732002 - TOPSOILING, 6" DEPTH
  ITEM 734013 - PERMANENT GRASS SEEDING, DRY GROUND
  ITEM 735535 - SOIL RETENTION BLANKET MULCH, TYPE 5
- (W) ITEM 760003 - PAVEMENT MILLING, HOT-MIX, VARIABLE DEPTH
- (X) ITEM 760507 - PROFILE MILLING, HOT-MIX
- (Y) ITEM 712005 - RIPRAP, R-4
- (Z) ITEM 720629 - BIFURCATED CONCRETE MEDIAN BARRIER (MODIFIED)
- (AA) ITEM 760017 - RUMBLE STRIPS, CONCRETE
- (BB) ITEM 760012 - RUMBLE STRIPS, BIKE FRIENDLY, HOT-MIX
- (CC) ITEM 760015 - RUMBLE STRIPS, CONCRETE SHALLOW DEPTH
- (DD) ITEM 760016 - RUMBLE STRIPS, HOT-MIX

Delaware T²/LTAP

Typical Sections

A little context

- Type A Borrow
- Soil cement
  - Type D Borrow
  - Portland Cement
  - Water
- PTB
  - AASHTO M43, 57 stone
  - Portland cement or asphalt cement

SECTION 1001 – BORROW

1001.01 Material Requirements.

Use classification, characteristics, and definitions of terms for borrow according to requirements of:

AASHTO M57

AASHTO M145

AASHTO M146

AASHTO M147

Material must have:

Maximum dry weight ≥ 90 pounds per cubic feet

Liquid Limit ≤ 40

No frozen material, rubbish, boulders in excess of 6 inches, or organics

Types and requirements in addition to above:

Table 1001-1: Dry Weight Percent Passing Square Mesh Sieves for Borrow Types

	Type A	Type B (special fill)	Type C (Backfill)	Type D (Cement Stabilization)	Type F (Common Borrow)
3"		100%		100%	Must meet general requirements listed in the paragraph above
2-1/2"	95 – 100%				
1"			85 – 100%		
No. 200	Max 35%	Max 10%	Max 25%	8 – 30%	

Delaware T²/LTAP

Typical Sections

AASHTO M43, 57 stone

Table 1—Standard Sizes of Processed Aggregate

Size Number	Nominal Size, Square Openings	Amounts Finer Than Each Laboratory Sieve (Square Openings), Mass, %														
		100 mm (4 in.)	90 mm ($3^1/_2$ in.)	75 mm (3 in.)	63 mm ($2^1/_2$ in.)	50 mm (2 in.)	37.5 mm ($1^1/_2$ in.)	25 mm (1 in.)	19 mm ($^3/_4$ in.)	12.5 mm ($^1/_2$ in.)	9.5 mm ($^3/_8$ in.)	4.75 mm (No. 4)	2.36 mm (No. 8)	1.18 mm (No. 16)	300 µm (No. 50)	150 µm (No. 100)
1	90 to 37.5 mm ($3^1/_2$ to $1^1/_2$ in.)	100	90 to 100	—	25 to 60	—	0 to 15	—	0 to 5	—	—	—	—	—	—	—
2	63 to 37.5 mm ($2^1/_2$ to $1^1/_2$ in.)	—	—	100	90 to 100	35 to 70	0 to 15	—	0 to 5	—	—	—	—	—	—	—
24	63 to 19.0 mm ($2^1/_2$ to $^3/_4$ in.)	—	—	100	90 to 100	—	25 to 60	—	0 to 10	0 to 5	—	—	—	—	—	—
3	50 to 25.0 mm (2 to 1 in.)	—	—	—	100	90 to 100	35 to 70	0 to 15	—	0 to 5	—	—	—	—	—	—
357	50 to 4.75 mm (2 in. to No. 4)	—	—	—	100	95 to 100	—	35 to 70	—	10 to 30	—	0 to 5	—	—	—	—
4	37.5 to 19.0 mm ($1^1/_2$ to $^3/_4$ in.)	—	—	—	—	100	90 to 100	20 to 55	0 to 15	—	0 to 5	—	—	—	—	—
467	37.5 to 4.75 mm ($1^1/_2$ to No. 4)	—	—	—	—	100	95 to 100	—	35 to 70	—	10 to 30	0 to 5	—	—	—	—
5	25.0 to 12.5 mm (1 to $^1/_2$ in.)	—	—	—	—	—	100	90 to 100	20 to 55	0 to 10	0 to 5	—	—	—	—	—
56	25.0 to 9.5 mm (1 to $^3/_8$ in.)	—	—	—	—	—	100	90 to 100	40 to 85	10 to 40	0 to 15	0 to 5	—	—	—	—
57	25.0 to 4.75 mm (1 to No. 4)	—	—	—	—	—	100	95 to 100	—	25 to 60	—	0 to 10	0 to 5	—	—	—
6	19.0 to 9.5 mm ($^3/_4$ to $^3/_8$ in.)	—	—	—	—	—	—	100	90 to 100	20 to 55	0 to 15	0 to 5	—	—	—	—
67	19.0 to 4.75 mm ($^3/_4$ to No. 4)	—	—	—	—	—	—	100	90 to 100	—	20 to 55	0 to 10	0 to 5	—	—	—
68	19.0 to 2.36 mm ($^3/_4$ to No. 8)	—	—	—	—	—	—	100	90 to 100	—	30 to 65	5 to 25	0 to 10	0 to 5	—	—
7	12.5 to 4.75 mm ($^1/_2$ to No. 4)	—	—	—	—	—	—	—	100	90 to 100	40 to 70	0 to 15	0 to 5	—	—	—
78	12.5 to 2.36 mm ($^1/_2$ to No. 8)	—	—	—	—	—	—	—	100	90 to 100	40 to 75	5 to 25	0 to 10	0 to 5	—	—
8	9.5 to 2.36 mm ($^3/_8$ to No. 8)	—	—	—	—	—	—	—	—	100	85 to 100	10 to 30	0 to 10	0 to 5	—	—
89	9.5 to 1.18 mm ($^3/_8$ to No. 16)	—	—	—	—	—	—	—	—	100	90 to 100	20 to 55	5 to 30	0 to 10	0 to 5	—
9	4.75 to 1.18 mm (No. 4 to No. 16)	—	—	—	—	—	—	—	—	—	100	85 to 100	10 to 40	0 to 10	0 to 5	—
10	4.75 mm (No. 4 to 0)[a]	—	—	—	—	—	—	—	—	—	100	85 to 100	—	—	—	10 to 30

[a] Screening.

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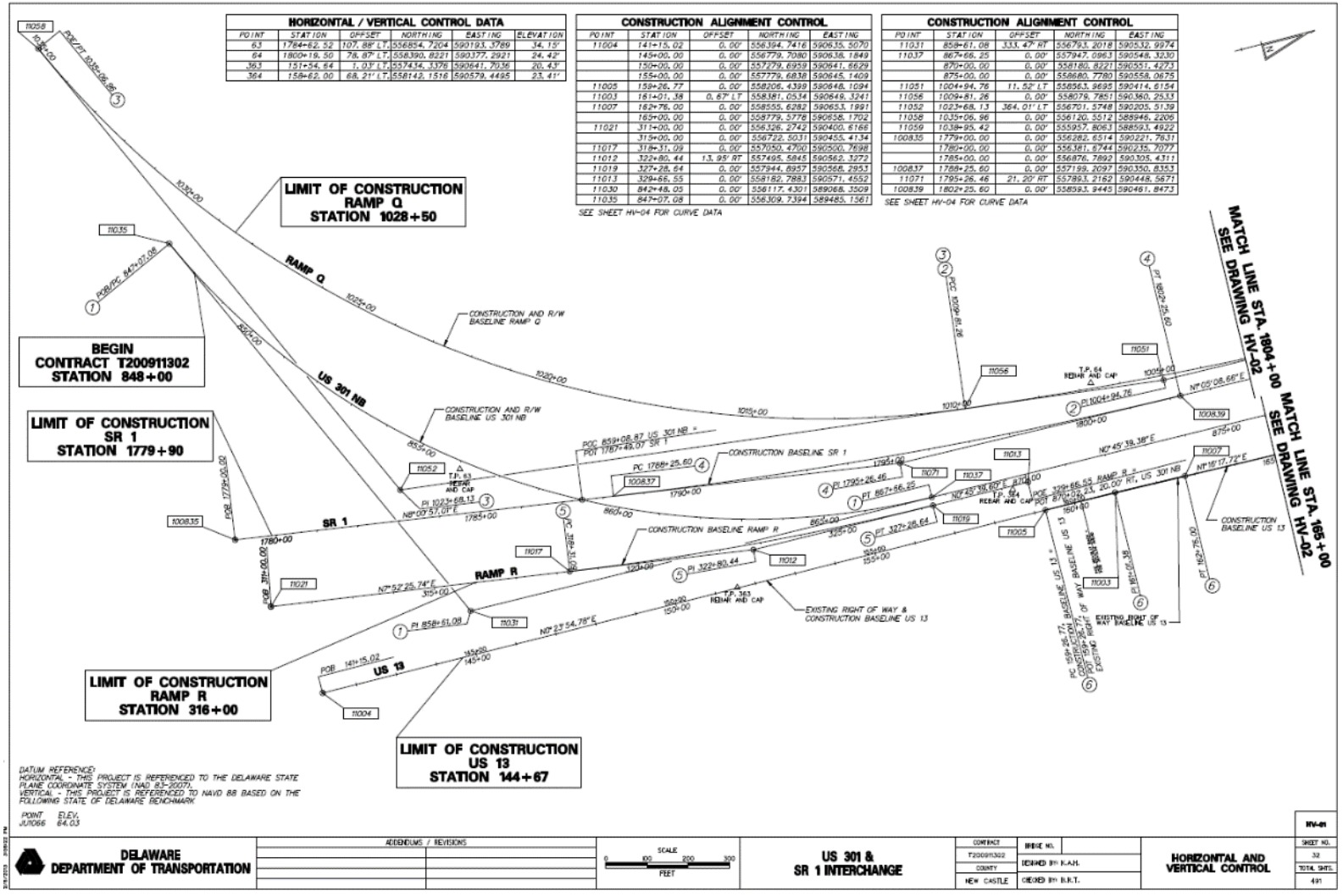
Horizontal and Vertical Control



Delaware T²/LTAP

Horizontal and Vertical Control

CIRCULAR CURVE NO. ① – US 301 NB

	STATION	NORTHING	EASTING
PC (11035)	847+07.08	556309.7194	589485.1561
PI (11031)	858+61.08	555793.2018	590532.9974
CC (11036)		557971.3996	588718.4844
PT (11037)	867+66.25	557947.0963	590548.3230
Radius:	1830.0000		
Design Speed(mph):	60.0000		
Superelevation:	-5.0000%		
Delta:	64° 28' 15.5392" Left		
Degree of Curvature(Arc):	3° 07' 51.3009"		
Length:	2038.1728		
Tangent:	1153.9962		
Chord:	1932.2453		
Middle Ordinate:	282.0709		
External:	333.4711		
Tangent Direction:	N 65° 13' 54.9145" E		
Radial Direction:	S 24° 46' 05.0855" E		
Chord Direction:	N 32° 59' 47.1449" E		
Radial Direction:	S 89° 14' 20.6248" E		
Tangent Direction:	N 0° 45' 39.3752" E		

CIRCULAR CURVE NO. ② – RAMP Q

	STATION	NORTHING	EASTING
PC (11054)	1000+07.54	559051.1235	590423.0297
PI (11051)	1004+94.75	558563.9695	590414.6154
CC (11055)		559229.0031	580124.5658
PCC (11056)	1009+81.26	558079.7851	590360.2533
Radius:	10300.0000		
Design Speed(mph):	70.0000		
Superelevation:	-3.0000%		
Delta:	5° 24' 59.5822" Rt		
Degree of Curvature(Arc):	0° 33' 22.5709"		
Length:	973.7274		
Tangent:	487.2286		
Chord:	973.3649		
Middle Ordinate:	11.5045		
External:	11.5173		
Tangent Direction:	S 0° 59' 22.3427" W		
Radial Direction:	N 89° 00' 37.6577" W		
Chord Direction:	S 3° 41' 52.1334" W		
Radial Direction:	N 83° 35' 38.0755" W		
Tangent Direction:	S 6° 24' 21.9245" W		

CIRCULAR CURVE NO. ③ – RAMP Q

	STATION	NORTHING	EASTING
PCC (11056)	1009+81.26	558079.7851	590360.2533
PI (11052)	1023+68.13	556701.5748	590205.5139
CC (11057)		558354.2586	587915.6134
PT (11058)	1035+06.96	556120.5312	588946.2206
Radius:	2460.0000		
Design Speed(mph):	70.0000		
Superelevation:	-5.0000%		
Delta:	58° 49' 33.0402" Rt		
Degree of Curvature(Arc):	2° 19' 44.7482"		
Length:	2525.6935		
Tangent:	1386.8698		
Chord:	2416.2131		
Middle Ordinate:	317.0864		
External:	364.0057		
Tangent Direction:	S 6° 24' 21.9290" W		
Radial Direction:	N 83° 35' 38.0710" W		
Chord Direction:	S 35° 49' 08.4491" W		
Radial Direction:	N 24° 46' 05.0309" W		
Tangent Direction:	S 65° 13' 54.9692" W		

CIRCULAR CURVE NO. ④ – SR 1

	STATION	NORTHING	EASTING
PC (100837)	1788+25.60	557199.2097	590350.8353
PI (11071)	1795+26.46	557893.2162	590448.5671
CC (100838)		558813.2694	578889.1895
PT (100839)	1802+25.60	558593.9445	590461.8473
Radius:	11574.7359		
Design Speed(mph):	70.0000		
Superelevation:	1.7000%		
Delta:	6° 55' 48.3463" Left		
Degree of Curvature(Arc):	0° 29' 43.0260"		
Length:	1399.9990		
Tangent:	700.8541		
Chord:	1399.1457		
Middle Ordinate:	21.1603		
External:	21.1991		
Tangent Direction:	N 8° 00' 57.0067" E		
Radial Direction:	S 81° 59' 02.9933" E		
Chord Direction:	N 4° 33' 02.8336" E		
Radial Direction:	S 88° 54' 51.3396" E		
Tangent Direction:	N 1° 05' 08.6604" E		

CIRCULAR CURVE NO. ⑤ – RAMP R

	STATION	NORTHING	EASTING
PC (11017)	316+31.09	557050.4700	590500.7698
PI (11012)	322+80.44	557495.5845	590562.3272
CC (11018)		558040.9214	583338.9330
PT (11019)	327+28.64	557944.8957	590568.2953
Radius:	7230.0000		
Design Speed(mph):	50.0000		
Superelevation:	-2.0000%		
Delta:	7° 06' 45.1448" Left		
Degree of Curvature(Arc):	0° 47' 32.9019"		
Length:	897.5473		
Tangent:	449.3509		
Chord:	896.9711		
Middle Ordinate:	13.9235		
External:	13.9503		
Tangent Direction:	N 7° 52' 25.7439" E		
Radial Direction:	S 82° 07' 34.2561" E		
Chord Direction:	N 4° 19' 02.6715" E		
Radial Direction:	S 89° 14' 20.4010" E		
Tangent Direction:	N 0° 45' 39.5990" E		

CIRCULAR CURVE NO. ⑥ – US 13

	STATION	NORTHING	EASTING
PC (11005)	159+26.77	558206.4399	590648.1094
PI (11003)	161+01.38	558381.0534	590649.3241
CC (11006)		558047.0147	613566.7550
PT (11007)	162+76.00	558555.6262	590653.1991
Radius:	22919.2000		
Design Speed(mph):	65.0000		
Superelevation:	NORMAL		
Delta:	0° 52' 22.9377" Rt		
Degree of Curvature(Arc):	0° 14' 58.9651"		
Length:	149.2288		
Tangent:	174.6178		
Chord:	149.2255		
Middle Ordinate:	0.6652		
External:	0.6652		
Tangent Direction:	N 0° 23' 54.7825" E		
Radial Direction:	S 89° 36' 05.2175" E		
Chord Direction:	N 0° 50' 06.2514" E		
Radial Direction:	S 89° 43' 42.2797" E		
Tangent Direction:	N 1° 16' 17.7203" E		

CIRCULAR CURVE NO. ⑦ – US 301 NB

	STATION	NORTHING	EASTING
PC (11038)	880+67.33	559248.0586	590565.6019
PI (11032)	883+12.74	559493.4484	590568.8611
CC (11039)		559353.0993	582506.3127
PT (11040)	885+58.00	559738.5818	590557.1848
Radius:	8060.0000		
Design Speed(mph):	60.0000		
Superelevation:	2.0000%		
Delta:	3° 29' 18.8478" Left		
Degree of Curvature(Arc):	0° 42' 35.1167"		
Length:	490.6712		
Tangent:	245.4114		
Chord:	490.5954		
Middle Ordinate:	3.7336		
External:	3.7353		
Tangent Direction:	N 0° 45' 39.3752" E		
Radial Direction:	S 89° 14' 20.6248" E		
Chord Direction:	N 0° 58' 59.0486" W		
Radial Direction:	N 87° 16' 22.5275" E		
Tangent Direction:	N 2° 43' 37.4725" W		

CIRCULAR CURVE NO. ⑧ – US 301 NB

	STATION	NORTHING	EASTING
PC (11041)	887+24.78	559905.1706	590549.2498
PI (11033)	889+89.87	560169.9837	590536.6371
CC (11042)		560288.6531	598600.1219
PT (11034)	892+54.78	560435.0133	590541.4508
Radius:	8060.0000		
Design Speed(mph):	60.0000		
Superelevation:	NORMAL		
Delta:	3° 46' 03.2062" Rt		
Degree of Curvature(Arc):	0° 42' 39.1167"		
Length:	529.9936		
Tangent:	265.0933		
Chord:	529.9601		
Middle Ordinate:	4.3559		
External:	4.3583		
Tangent Direction:	N 2° 43' 37.4725" W		
Radial Direction:	N 87° 16' 22.5275" E		
Chord Direction:	N 0° 50' 35.8934" W		
Radial Direction:	S 88° 57' 34.2663" E		
Tangent Direction:	N 1° 02' 25.7337" W		

CIRCULAR CURVE NO. ⑨ – SR 1

	STATION	NORTHING	EASTING
PC (100852)	1825+16.81	560684.7432	590505.2625
PI (11073)	1834+41.87	561809.6410	590523.7912
CC (100853)		560939.0269	587940.3879
PT (100854)	1843+06.38	562570.1249	589996.0982
Radius:	2864.7890		
Design Speed(mph):	70.0000		
Superelevation:	5.0000%		
Delta:	35° 47' 29.0019" Left		
Degree of Curvature(Arc):	2° 00' 00.0000"		
Length:	1789.5695		
Tangent:	925.0639		
Chord:	1760.6140		
Middle Ordinate:	138.6057		
External:	145.6527		
Tangent Direction:	N 1° 05' 08.6598" E		
Radial Direction:	S 88° 54' 51.3402" E		
Chord Direction:	N 16° 48' 35.8196" E		
Radial Direction:	N 55° 17' 39.6579" E		
Tangent Direction:	N 34° 42' 20.3421" W		

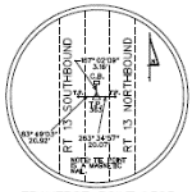
SEE SHEET HV-02 FOR CURVE 10 DATA

TRAVERSE POINT #63
REBAR AND CAP

TRAVERSE POINT #64
REBAR AND CAP

TRAVERSE POINT #65
REBAR AND CAP

TRAVERSE POINT #66
REBAR AND CAP



TRAVERSE POINT #363
REBAR AND CAP

TRAVERSE POINT #364
REBAR AND CAP

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

US 301 & SR 1 INTERCHANGE

CONTRACT T200911302 | BRIDGE NO. | DESIGNED BY: K.A.H. | COUNTY: NEW CASTLE | DRAWN BY: B.R.T.

HORIZONTAL AND VERTICAL CONTROL

SHEET NO. 35 | TOTAL SHTS. 491

HV-04

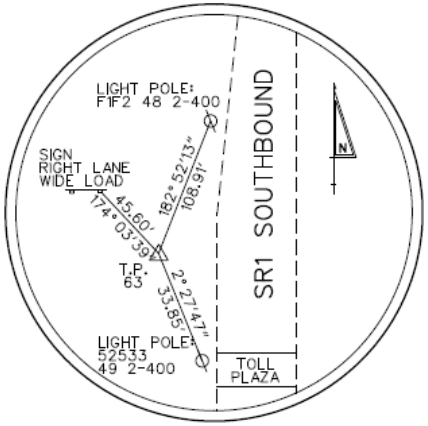
Delaware T²/LTAP

Horizontal and Vertical Control

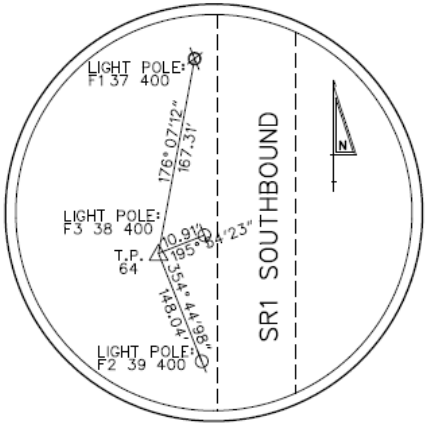
CIRCULAR CURVE NO. ⑦ – US 301 NB

		STATION	NORTHING	EASTING
PC	(11038)	880+67.33	559248.0586	590565.6019
PI	(11032)	883+12.74	559493.4484	590568.8611
CC	(11039)		559355.0993	582506.3127
PT	(11040)	885+58.00	559738.5818	590557.1848
Radius:		8060.0000		
Design Speed(mph):		60.0000		
Superelevation:		2.0000%		
Delta:		3° 29′ 16.8478″ Left		
Degree of Curvature(Arc):		0° 42′ 39.1167″		
Length:		490.6712		
Tangent:		245.4114		
Chord:		490.5954		
Middle Ordinate:		3.7336		
External:		3.7353		
Tangent Direction:	N	0° 45′ 39.3752″ E		
Radial Direction:	S	89° 14′ 20.6248″ E		
Chord Direction:	N	0° 58′ 59.0486″ W		
Radial Direction:	N	87° 16′ 22.5275″ E		
Tangent Direction:	N	2° 43′ 37.4725″ W		

SEE SHEET HV-02 FOR CURVE 10 DATA



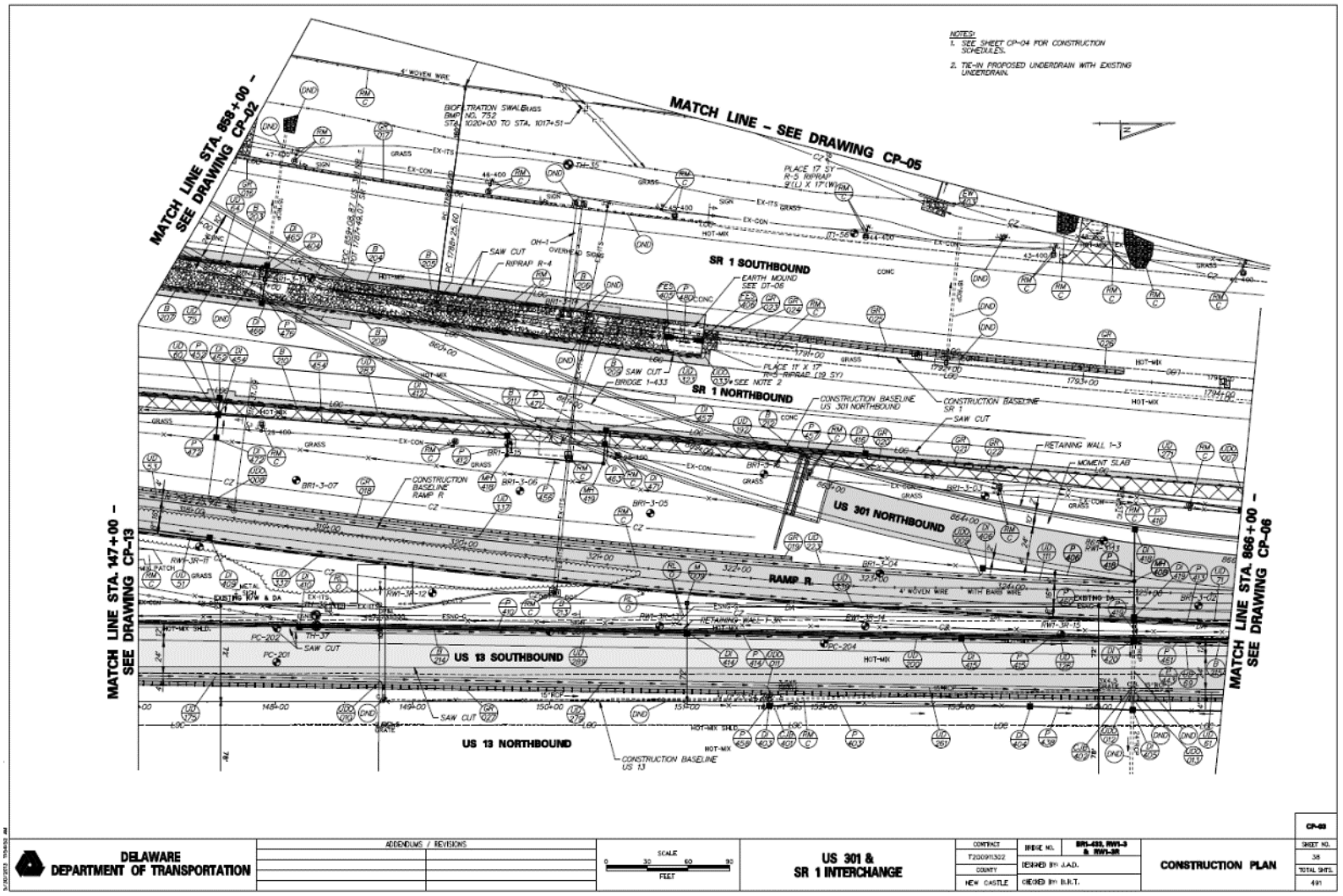
TRAVERSE POINT #63
REBAR AND CAP



TRAVERSE POINT #64
REBAR AND CAP

Delaware T²/LTAP

Construction Plans



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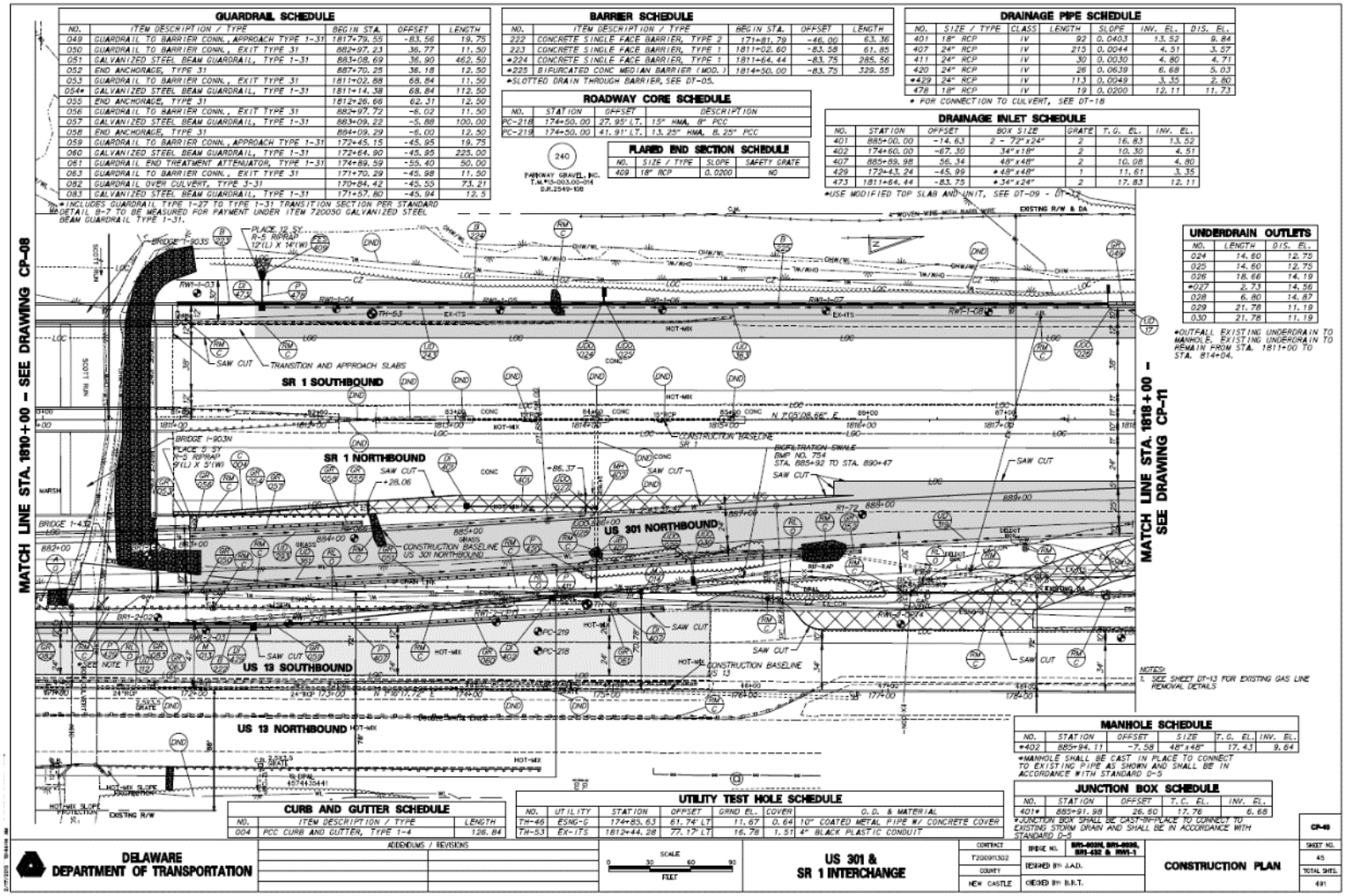
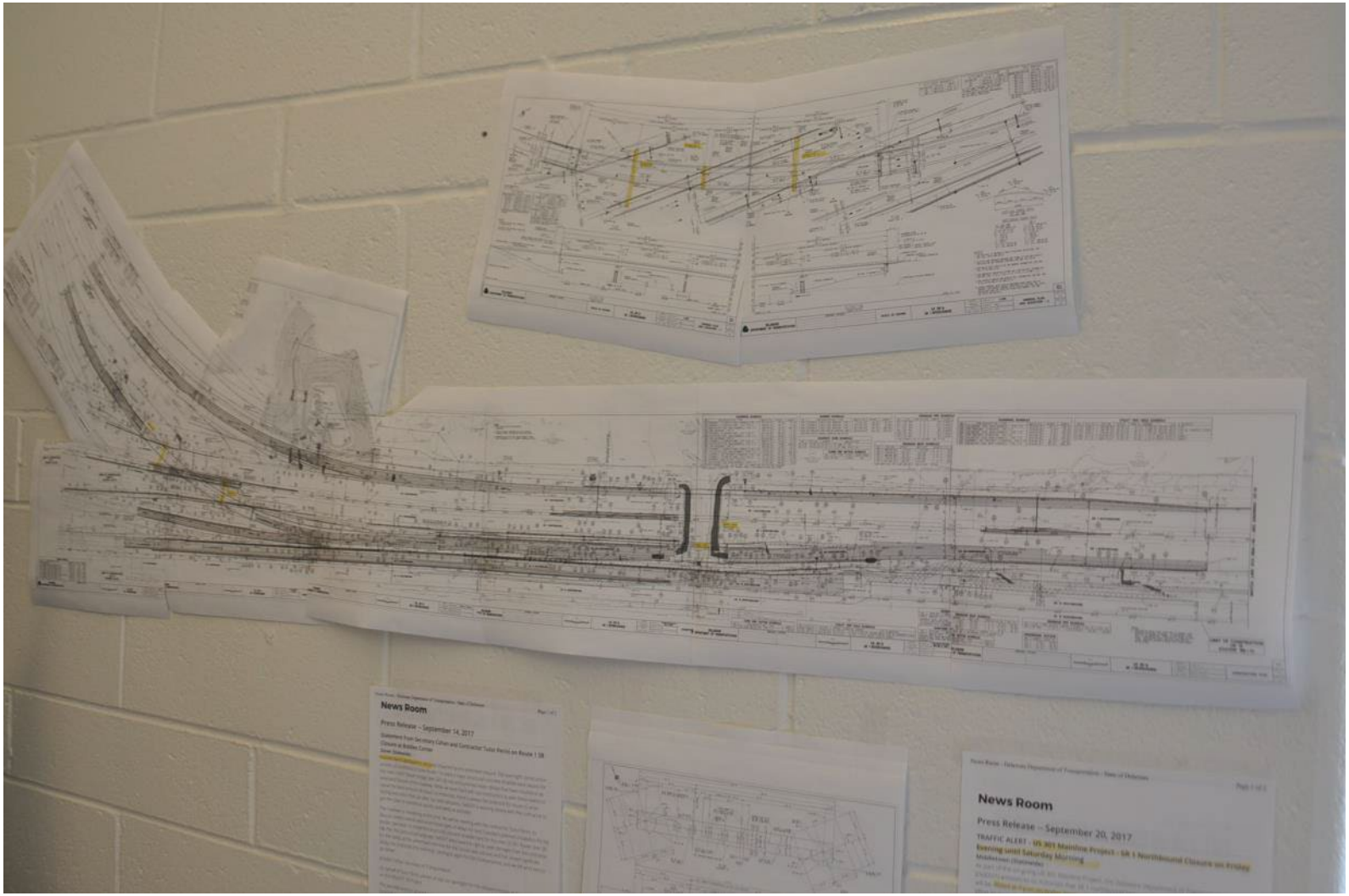
Construction Plans



Delaware T²/LTAP

Construction Plans

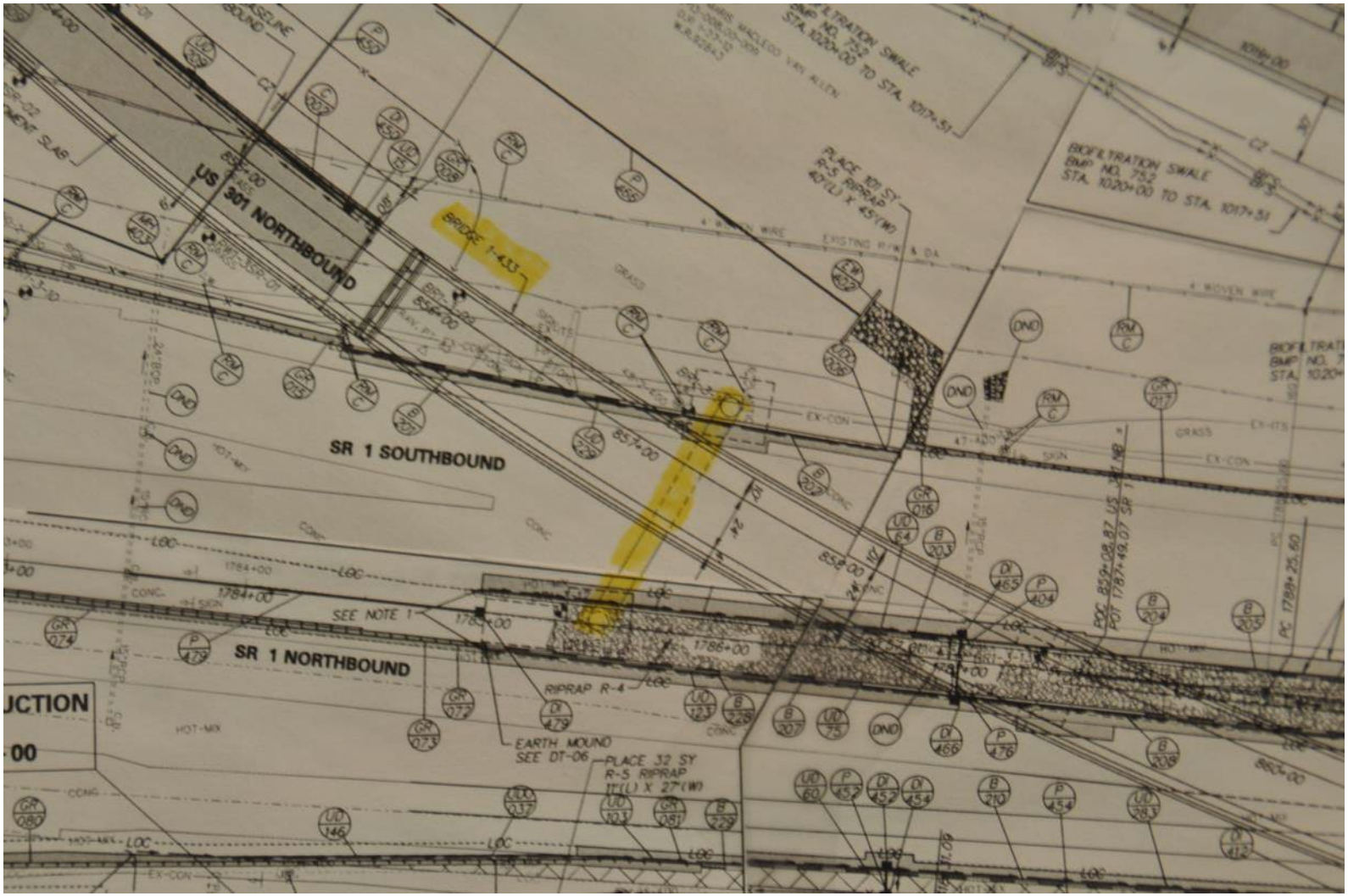


Delaware T²/LTAP

Construction Plans

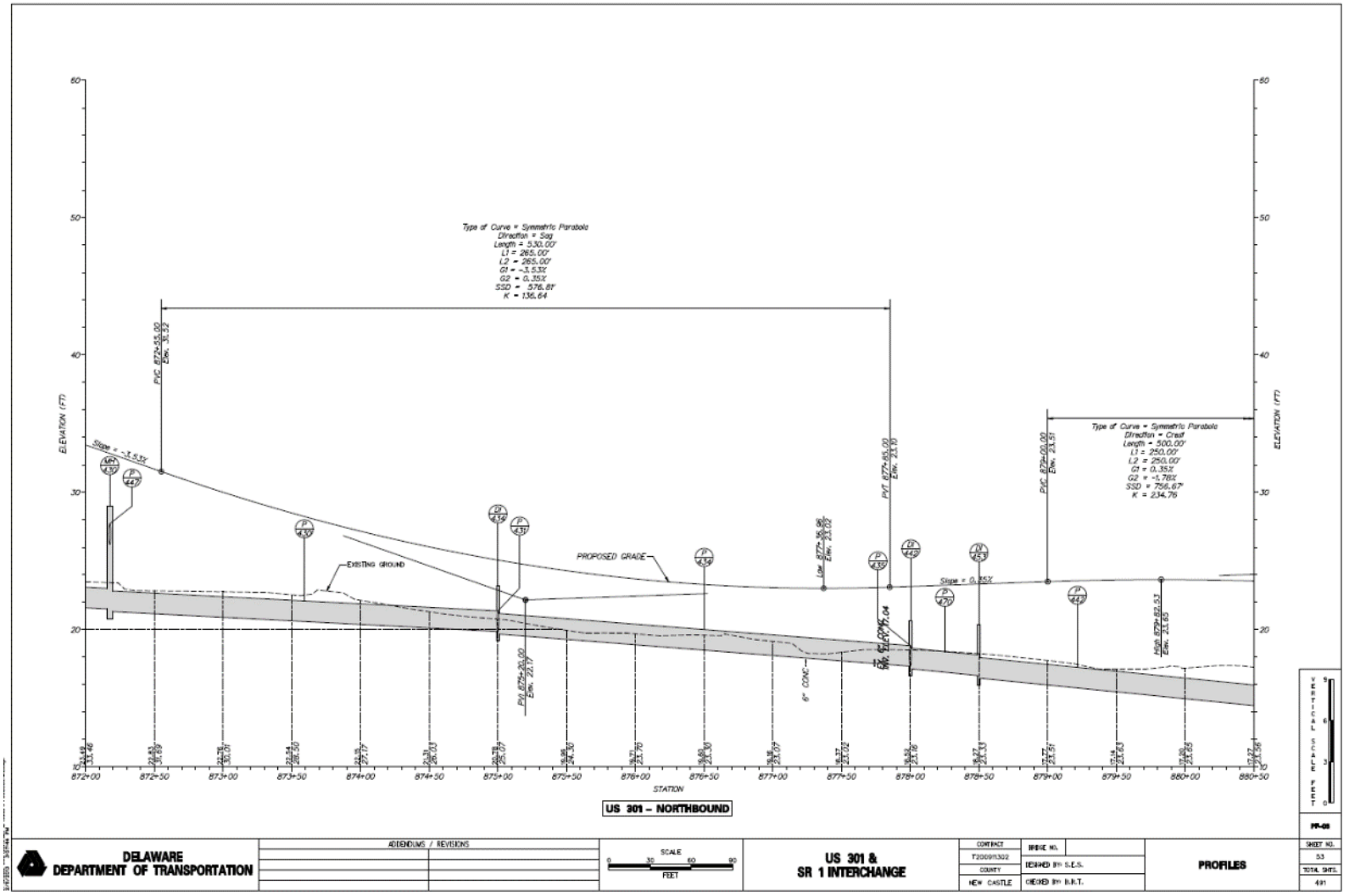
Delaware
T²/LTAP

Construction Plans



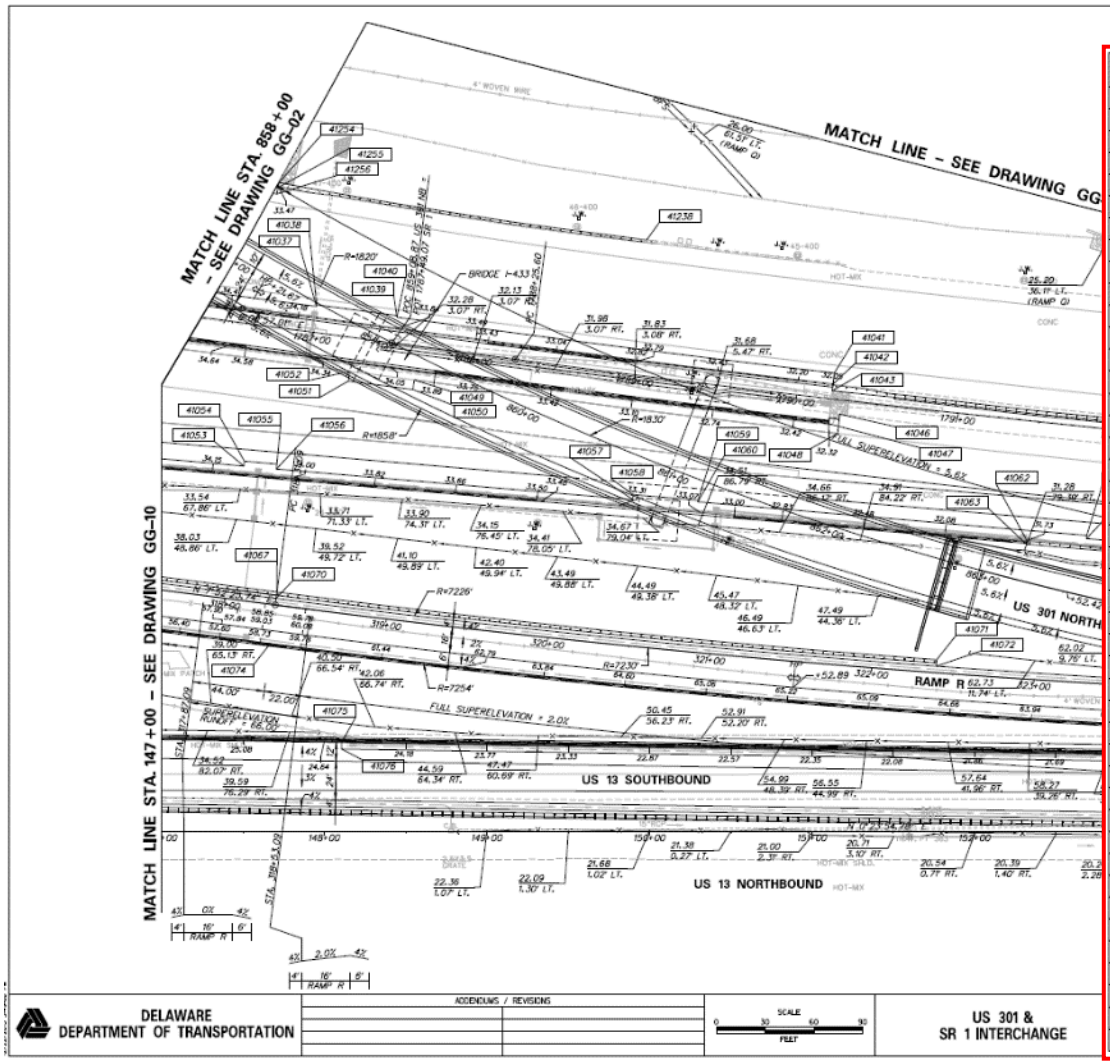
Delaware T²/LTAP

Profiles



Delaware T²/LTAP

Grades and Geometrics

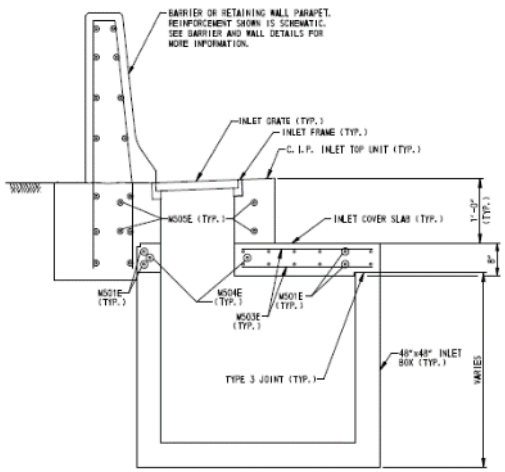


COORDINATE LIST

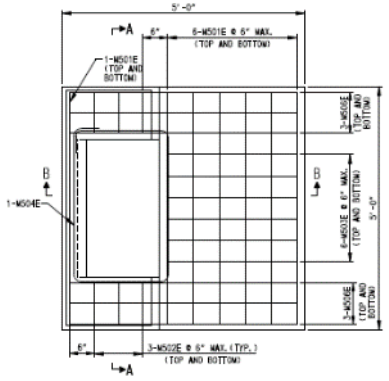
POINT NO.	STATION	OFFSET	NORTHING	EASTING
41037	1787+00.00	-16.00	557077.0662	590317.4768
41038	1787+00.00	-17.00	557077.2057	590316.4866
41039	1787+50.00	-16.00	557126.5777	590324.4492
41040	1787+50.00	-17.00	557126.7171	590323.4589
41041	1790+21.44	-16.00	557395.3178	590360.6232
41042	1790+21.43	-9.19	557394.4710	590367.3757
41043	1790+21.42	-4.95	557393.9422	590371.5917
41044	1793+29.27	-8.70	557700.1677	590401.5437
41045	1793+29.27	-4.70	557699.7829	590405.5252
41046	1790+27.67	8.73	557398.4766	590385.9323
41047	1790+21.43	15.35	557391.4639	590391.7354
41048	1790+27.67	20.68	557397.0142	590397.7950
41049	1787+65.60	20.80	557136.8918	590363.0629
41050	1787+65.60	26.80	557136.0590	590369.0048
41051	1787+25.60	26.82	557096.4462	590363.4526
41052	1787+25.60	20.82	557097.2790	590357.5106
41053	1786+68.86	87.20	557031.8408	590415.3264
41054	1786+68.72	84.20	557032.1185	590412.3393
41055	1786+88.70	83.33	557052.0257	590414.2653
41056	1786+88.84	86.33	557051.7479	590417.2536
41057	1789+08.05	76.16	557270.8118	590437.5272
41058	1789+07.93	73.17	557271.0887	590434.5483
41059	1789+47.65	71.63	557310.9170	590438.2507
41060	1789+47.69	72.58	557310.8288	590439.1995
41062	1791+49.99	73.07	557512.8615	590464.1796
41063	1791+50.04	75.57	557512.6354	590466.6693
41064	1791+86.18	66.35	557549.7897	590461.5088
41065	1791+86.21	68.35	557549.6046	590463.4997
41068	1792+50.00	71.58	557613.0751	590473.5004
41069	1792+50.02	74.06	557612.8423	590475.9644
41070	318+31.09	-4.00	557051.0200	590496.8078
41071	322+39.49	-8.00	557457.0278	590537.2924
41072	322+39.49	-4.00	557456.7045	590541.2777
41073	324+86.75	-4.00	557703.3155	590557.0422
41074	318+31.09	24.00	557047.1842	590524.5438
41075	148+10.65	-54.72	557090.7313	590585.6264
41076	148+10.59	-50.72	557090.6419	590589.6254
41079	154+75.00	-45.00	557754.9974	590599.9681
41080	154+75.00	-5.00	557754.7192	590639.9671
41238	1788+96.40	-83.18	557280.4446	590278.0532
41254	1786+67.12	-88.35	557054.5992	590241.2444
41255	1786+66.93	-85.27	557053.9782	590244.2710
41256	1786+66.68	-81.28	557053.1743	590248.1893

Delaware T²/LTAP

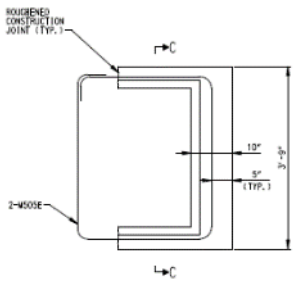
Construction Details



48"X48" DRAINAGE INLET ASSEMBLY
SCALE: 1"=1'-0"



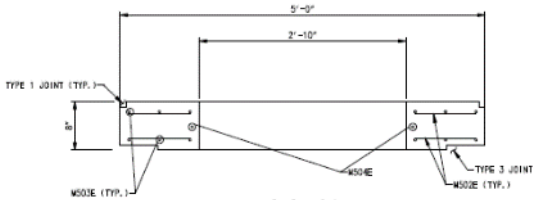
INLET COVER SLAB DETAIL
SCALE: 1"=1'-0"



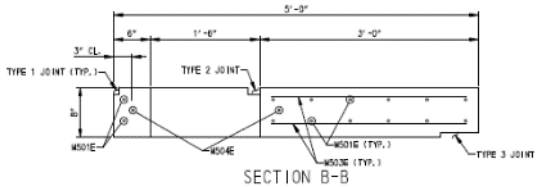
INLET TOP UNIT DETAIL
SCALE: 1"=1'-0"

NOTES:

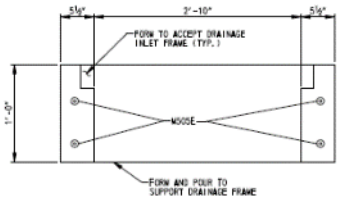
1. PAYMENT FOR DRAINAGE INLETS INCLUDING BOXES, GRATES, TOP UNITS, COVER SLABS, MODIFICATIONS TO CONCRETE MEDIAN BARRIER, JOINT SEALANT AND ALL WORK ASSOCIATED WITH DRAINAGE INLET ASSEMBLIES WILL BE MADE UNDER ITEM NO. 708053 - DRAINAGE INLET, 48"X48".
2. FOR DRAINAGE INLET ASSEMBLY LOCATIONS SEE CONSTRUCTION PLANS.
3. SEE STANDARD NO. D-4 FOR INLET BOX DETAILS. SEE STANDARD NO. D-5 FOR GRATE, FRAME, AND JOINT DETAILS.
4. MINIMUM REINFORCEMENT COVER SHALL BE 1½".
5. HOT POURED JOINT SEALANT SHALL BE USED TO FILL THE GAP BETWEEN THE DRAINAGE INLET FRAMES.



SECTION A-A
SCALE: 1½"=1'-0"



SECTION B-B
SCALE: 1½"=1'-0"



SECTION C-C
SCALE: 1½"=1'-0"

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE: AS SHOWN

US 301 & SR 1 INTERCHANGE

CONTRACT T200911302
COUNTY NEW CASTLE
BRIDGE NO.
DESIGNED BY: K.M.K.
CHECKED BY: B.K.B.

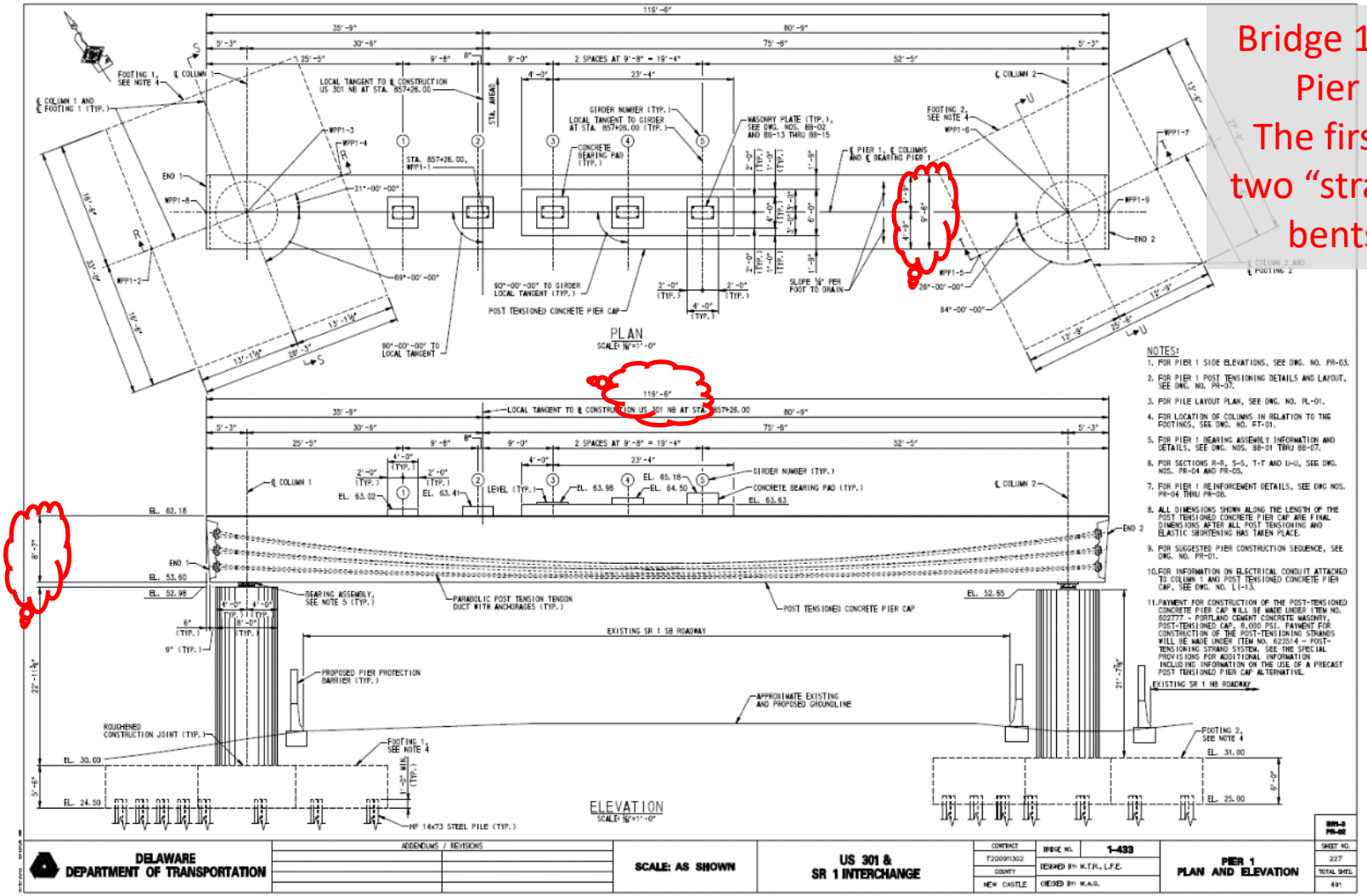
CONSTRUCTION DETAILS

DT-01
SHEET NO. 94
TOTAL SHTS. 491

Delaware T²/LTAP

Nominal weight: 8’-7” x 9’-6” x 116’-6” = 9,499.6 CF x 150 #/CF = 1.4 million pounds = 712 ton

Bridge Plans



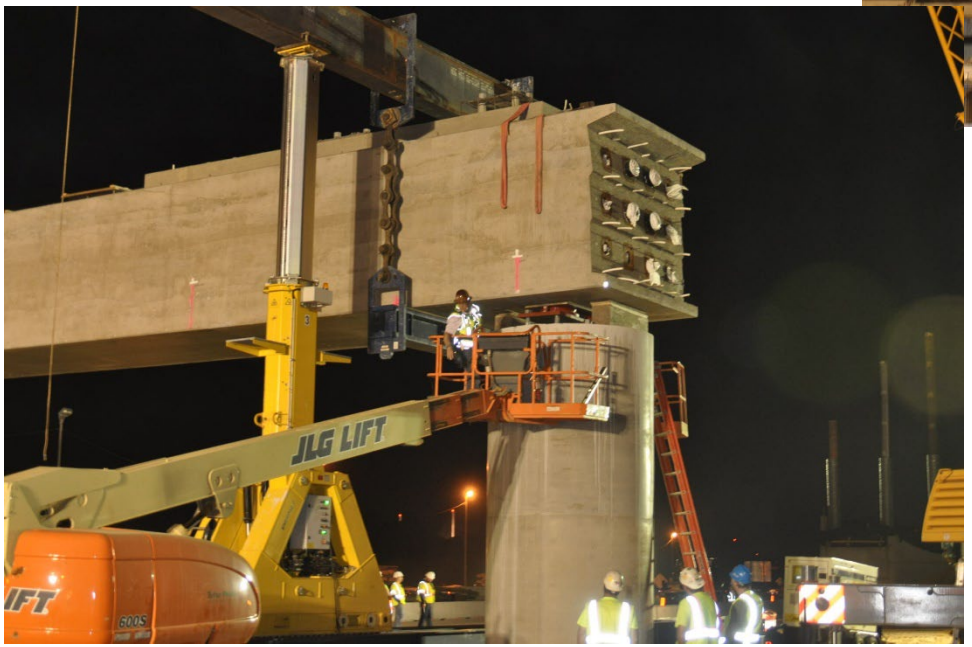
Bridge 1-433
Pier 1
The first of two “straddle bents”

Delaware T²/LTAP

Straddle Bent

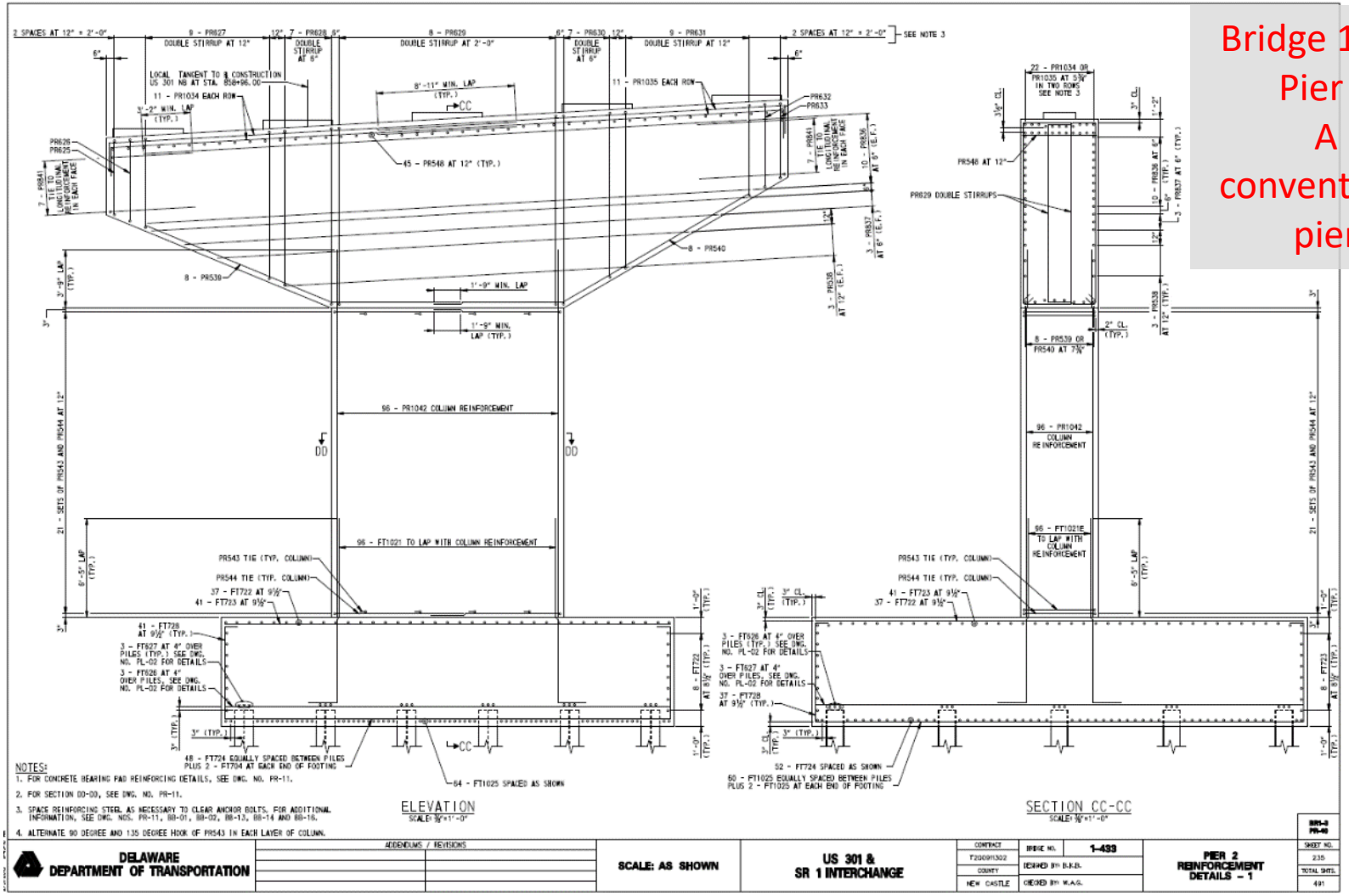
Delaware
T²/LTAP

Straddle Bent



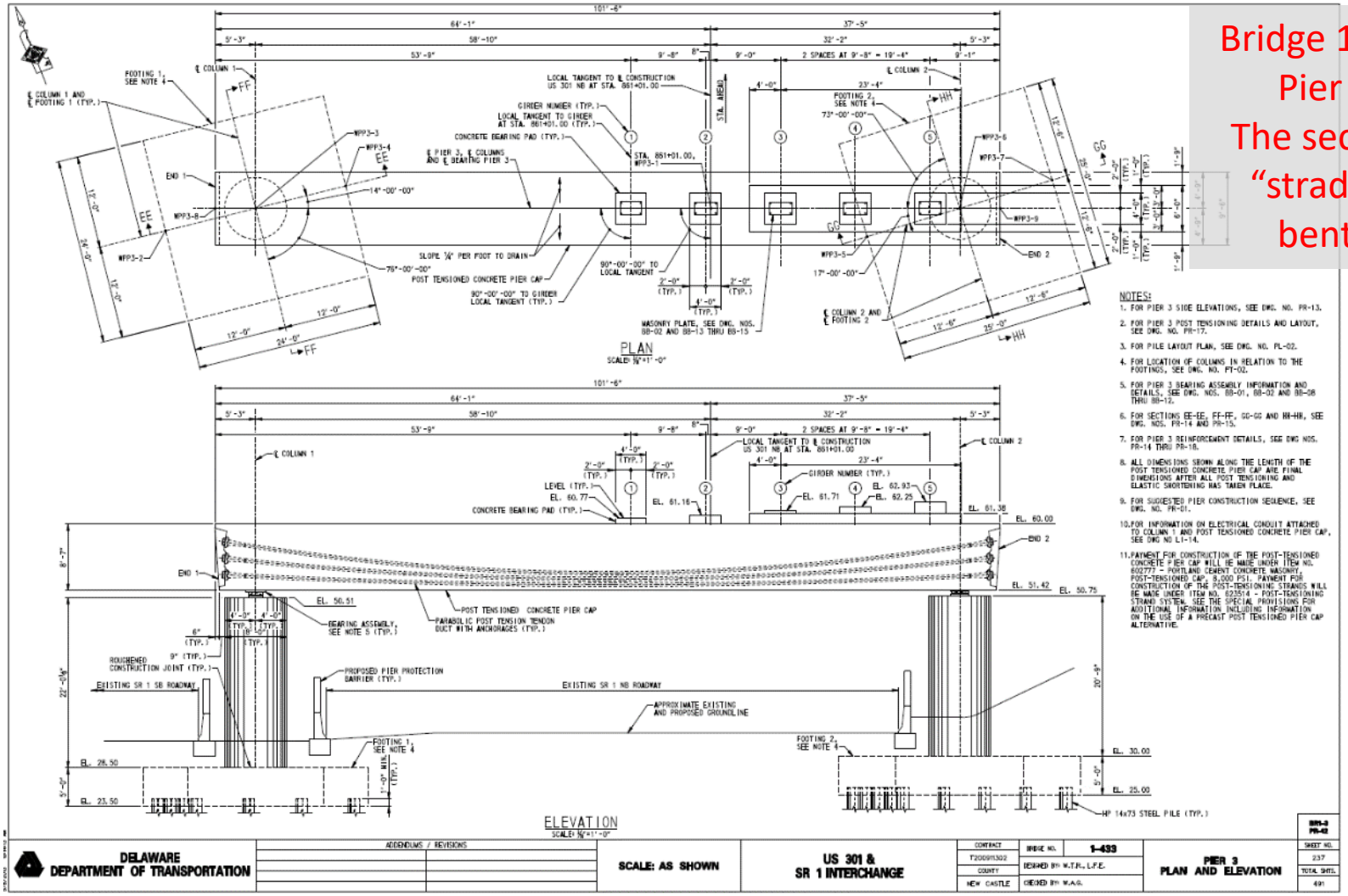
Delaware T²/LTAP

Bridge Plans



Delaware T²/LTAP

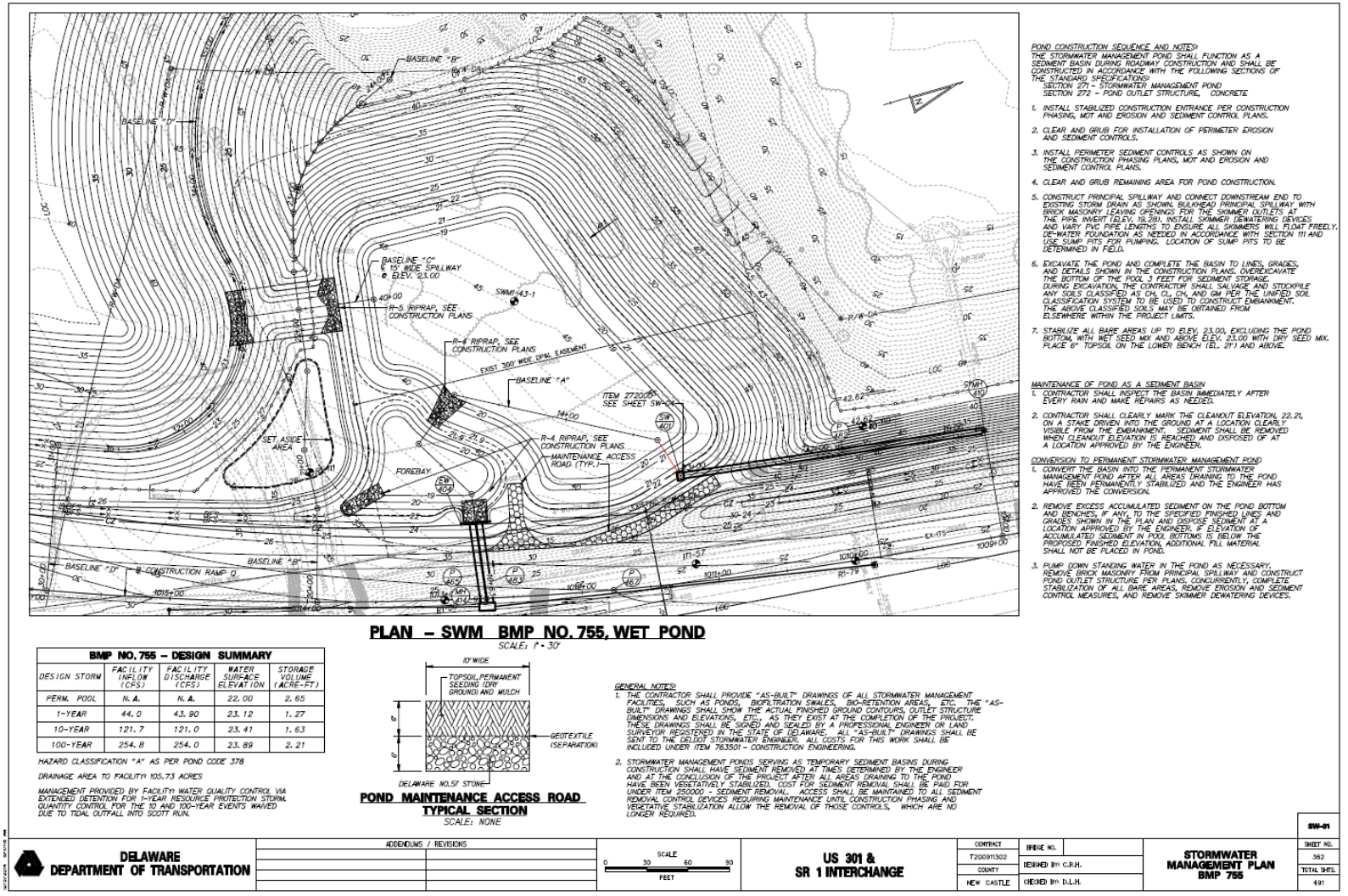
Bridge Plans



Bridge 1-433
Pier 3
The second "straddle bent"

Delaware T²/LTAP

Stormwater Plans



POND CONSTRUCTION SEQUENCE AND NOTES:

THE STORMWATER MANAGEMENT POND SHALL FUNCTION AS A SEDIMENT BASIN DURING ROADWAY CONSTRUCTION AND SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING SECTIONS OF THE STANDARD SPECIFICATIONS:

SECTION 271 – STORMWATER MANAGEMENT POND
SECTION 272 – POND OUTLET STRUCTURE, CONCRETE

1. INSTALL STABILIZED CONSTRUCTION ENTRANCE PER CONSTRUCTION PHASING, MOT AND EROSION AND SEDIMENT CONTROL PLANS.
2. CLEAR AND GRUB FOR INSTALLATION OF PERIMETER EROSION AND SEDIMENT CONTROLS.
3. INSTALL PERIMETER SEDIMENT CONTROLS AS SHOWN ON THE CONSTRUCTION PHASING PLANS, MOT AND EROSION AND SEDIMENT CONTROL PLANS.
4. CLEAR AND GRUB REMAINING AREA FOR POND CONSTRUCTION.
5. CONSTRUCT PRINCIPAL SPILLWAY AND CONNECT DOWNSTREAM END TO EXISTING STORM DRAIN AS SHOWN. BULKHEAD PRINCIPAL SPILLWAY WITH BRICK MASONRY LEAVING OPENINGS FOR THE SKIMMER OUTLETS AT THE PIPE INVERT (ELEV. 19.28). INSTALL SKIMMER DEWATERING DEVICES AND VARY PVC PIPE LENGTHS TO ENSURE ALL SKIMMERS WILL FLOAT FREELY. DE-WATER FOUNDATION AS NEEDED IN ACCORDANCE WITH SECTION 111 AND USE SUMP PITS FOR PUMPING. LOCATION OF SUMP PITS TO BE DETERMINED IN FIELD.
6. EXCAVATE THE POND AND COMPLETE THE BASIN TO LINES, GRADES, AND DETAILS SHOWN IN THE CONSTRUCTION PLANS. OVEREXCAVATE THE BOTTOM OF THE POOL 3 FEET FOR SEDIMENT STORAGE. DURING EXCAVATION, THE CONTRACTOR SHALL SALVAGE AND STOCKPILE ANY SOILS CLASSIFIED AS CH, CL, CH, AND OH PER THE UNIFIED SOIL CLASSIFICATION SYSTEM TO BE USED TO CONSTRUCT EMBANKMENT. THE ABOVE CLASSIFIED SOILS MAY BE OBTAINED FROM ELSEWHERE WITHIN THE PROJECT LIMITS.
7. STABILIZE ALL BARE AREAS UP TO ELEV. 23.00, EXCLUDING THE POND BOTTOM, WITH WET SEED MIX AND ABOVE ELEV. 23.00 WITH DRY SEED MIX. PLACE 6" TOPSOIL ON THE LOWER BENCH (EL. 21') AND ABOVE.

MAINTENANCE OF POND AS A SEDIMENT BASIN

1. CONTRACTOR SHALL INSPECT THE BASIN IMMEDIATELY AFTER EVERY RAIN AND MAKE REPAIRS AS NEEDED.
2. CONTRACTOR SHALL CLEARLY MARK THE CLEANOUT ELEVATION, 22.21, ON A STAKE DRIVEN INTO THE GROUND AT A LOCATION CLEARLY VISIBLE FROM THE EMBANKMENT. SEDIMENT SHALL BE REMOVED WHEN CLEANOUT ELEVATION IS REACHED AND DISPOSED OF AT A LOCATION APPROVED BY THE ENGINEER.

CONVERSION TO PERMANENT STORMWATER MANAGEMENT POND

1. CONVERT THE BASIN INTO THE PERMANENT STORMWATER MANAGEMENT POND AFTER ALL AREAS DRAINING TO THE POND HAVE BEEN PERMANENTLY STABILIZED AND THE ENGINEER HAS APPROVED THE CONVERSION.
2. REMOVE EXCESS ACCUMULATED SEDIMENT ON THE POND BOTTOM AND BENCHES, IF ANY, TO THE SPECIFIED FINISHED LINES AND GRADES SHOWN IN THE PLAN AND DISPOSE SEDIMENT AT A LOCATION APPROVED BY THE ENGINEER. IF ELEVATION OF ACCUMULATED SEDIMENT IN POOL BOTTOMS IS BELOW THE PROPOSED FINISHED ELEVATION, ADDITIONAL FILL MATERIAL SHALL NOT BE PLACED IN POND.
3. PUMP DOWN STANDING WATER IN THE POND AS NECESSARY. REMOVE BRICK MASONRY FROM PRINCIPAL SPILLWAY AND CONSTRUCT POND OUTLET STRUCTURE PER PLANS, CONCURRENTLY. COMPLETE STABILIZATION OF ALL BARE AREAS, REMOVE EROSION AND SEDIMENT CONTROL MEASURES, AND REMOVE SKIMMER DEWATERING DEVICES.

PLAN – SWM BMP NO. 755, WET POND

SCALE: 1" = 30'

BMP NO. 755 – DESIGN SUMMARY				
DESIGN STORM	FACILITY INFLOW (CFS)	FACILITY DISCHARGE (CFS)	WATER SURFACE ELEVATION	STORAGE VOLUME (ACRE-FT)
PERM. POOL	N. A.	N. A.	22.00	2.65
1-YEAR	44.0	43.90	23.12	1.27
10-YEAR	121.7	121.0	23.41	1.63
100-YEAR	254.8	254.0	23.89	2.21

HAZARD CLASSIFICATION "A" AS PER POND CODE 378

DRAINAGE AREA TO FACILITY: 105.73 ACRES

MANAGEMENT PROVIDED BY FACILITY: WATER QUALITY CONTROL VIA EXTENDED DETENTION FOR 1-YEAR RESOURCE PROTECTION STORM. QUANTITY CONTROL FOR THE 10 AND 100-YEAR EVENTS WAIVED DUE TO TIDAL OUTFALL INTO SCOTT RUN.

POND MAINTENANCE ACCESS ROAD TYPICAL SECTION

SCALE: NONE

GENERAL NOTES:

1. THE CONTRACTOR SHALL PROVIDE "AS-BUILT" DRAWINGS OF ALL STORMWATER MANAGEMENT FACILITIES, SUCH AS PONDS, INFILTRATION SWALES, BIO-RETENTION AREAS, ETC. THE "AS-BUILT" DRAWINGS SHALL SHOW THE ACTUAL FINISHED GROUND CONTOURS, OUTLET STRUCTURE DIMENSIONS AND ELEVATIONS, ETC., AS THEY EXIST AT THE COMPLETION OF THE PROJECT. THESE DRAWINGS SHALL BE SIGNED AND SEALED BY A PROFESSIONAL ENGINEER OR LAND SURVEYOR REGISTERED IN THE STATE OF DELAWARE. ALL "AS-BUILT" DRAWINGS SHALL BE SENT TO THE DELDOT STORMWATER ENGINEER. ALL COSTS FOR THIS WORK SHALL BE INCLUDED UNDER ITEM 763501 – CONSTRUCTION ENGINEERING.
2. STORMWATER MANAGEMENT PONDS SERVING AS TEMPORARY SEDIMENT BASINS DURING CONSTRUCTION SHALL HAVE SEDIMENT REMOVED AT TIMES DETERMINED BY THE ENGINEER AND AT THE CONCLUSION OF THE PROJECT AFTER ALL AREAS DRAINING TO THE POND HAVE BEEN VEGETATIVELY STABILIZED. COST FOR SEDIMENT REMOVAL SHALL BE PAID FOR UNDER ITEM 250000 – SEDIMENT REMOVAL. ACCESS SHALL BE MAINTAINED TO ALL SEDIMENT REMOVAL CONTROL DEVICES REQUIRING MAINTENANCE UNTIL CONSTRUCTION PHASING AND VEGETATIVE STABILIZATION ALLOW THE REMOVAL OF THOSE CONTROLS, WHICH ARE NO LONGER REQUIRED.

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

US 301 & SR 1 INTERCHANGE

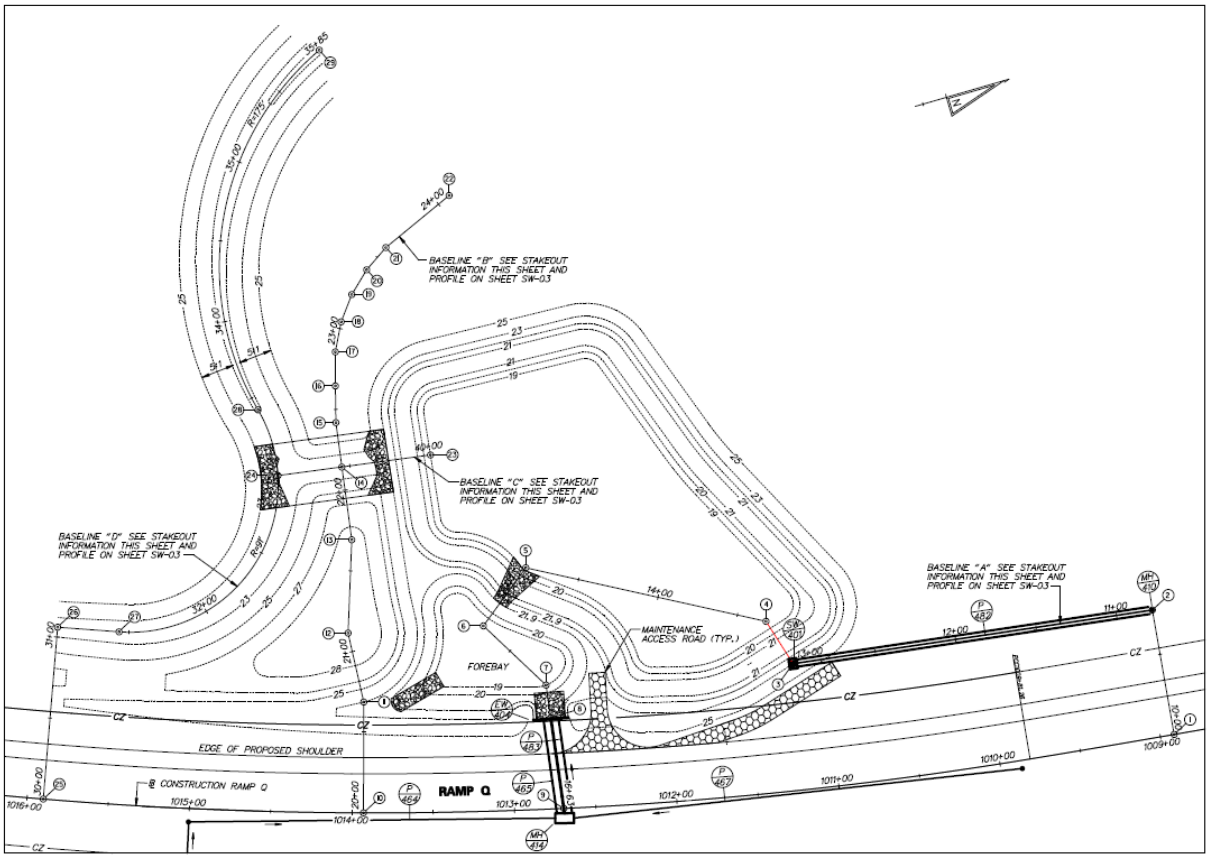
CONTRACT T200911302
COUNTY NEW CASTLE
BRIDGE NO.
DESIGNED BY: C.R.H.
CHECKED BY: D.L.H.

STORMWATER MANAGEMENT PLAN BMP 755

SW-01
SHEET NO. 362
TOTAL SHTS. 491

Delaware T²/LTAP

Stormwater Plans



STAKEOUT PLAN – SWM BMP NO. 755, WET POND

SCALE: 1" = 30'

BASELINE "A" STAKEOUT INFORMATION

POINT NO.	STATION	NORTHING	EASTING
1	POB STA.20+00.00	558169.09	590369.89
2	PI STA.13+77.71	558177.09	590282.68
3	PI STA.13+01.03	557955.60	590264.13
4	PI STA.13+31.96	557946.67	590234.51
5	PI STA.14+85.29	557813.55	590162.56
6	PI STA.15+27.51	557778.72	590189.21
7	PI STA.15+90.59	557805.89	590235.40
8	PI STA.16+00.84	557803.18	590255.57
9	PI STA.16+57.23	557795.69	590316.36

BASELINE "B" STAKEOUT INFORMATION

POINT NO.	STATION	NORTHING	EASTING
10	POB STA.20+00.00	557676.43	590280.39
11	PI STA.20+68.18	557695.21	590219.85
12	PI STA.21+11.67	557697.49	590176.11
13	PI STA.21+69.10	557715.31	590116.82
14	PI STA.22+14.26	557731.62	590072.1
15	PI STA.22+41.86	557725.59	590044.79
16	PI STA.22+64.43	557731.44	590022.99
17	PI STA.22+85.39	557737.13	590002.62
18	PI STA.23+04.22	557745.61	589986.01
19	PI STA.23+22.23	557756.48	589971.64
20	PI STA.23+40.00	557769.44	589959.48
21	PI STA.23+58.05	557784.50	589949.53
22	POE STA.24+08.48	557830.69	589929.31

BASELINE "C" STAKEOUT INFORMATION

POINT NO.	STATION	NORTHING	EASTING
23	POB STA.40+00.00	557776.1	590079.78
24	PI STA.40+94.64	557682.42	590066.41

BASELINE "D" STAKEOUT INFORMATION

POINT NO.	STATION	NORTHING	EASTING
25	POB STA.30+00.00	557489.37	590186.56
26	PI STA.31+06.09	557526.66	590116.24
27	PC STA.31+43.99	557562.25	590132.28
28	PRC STA.33+41.78	557681.69	590024.17
29	PT STA.35+85.48	557778.24	589926.52

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

US 301 & SR 1 INTERCHANGE

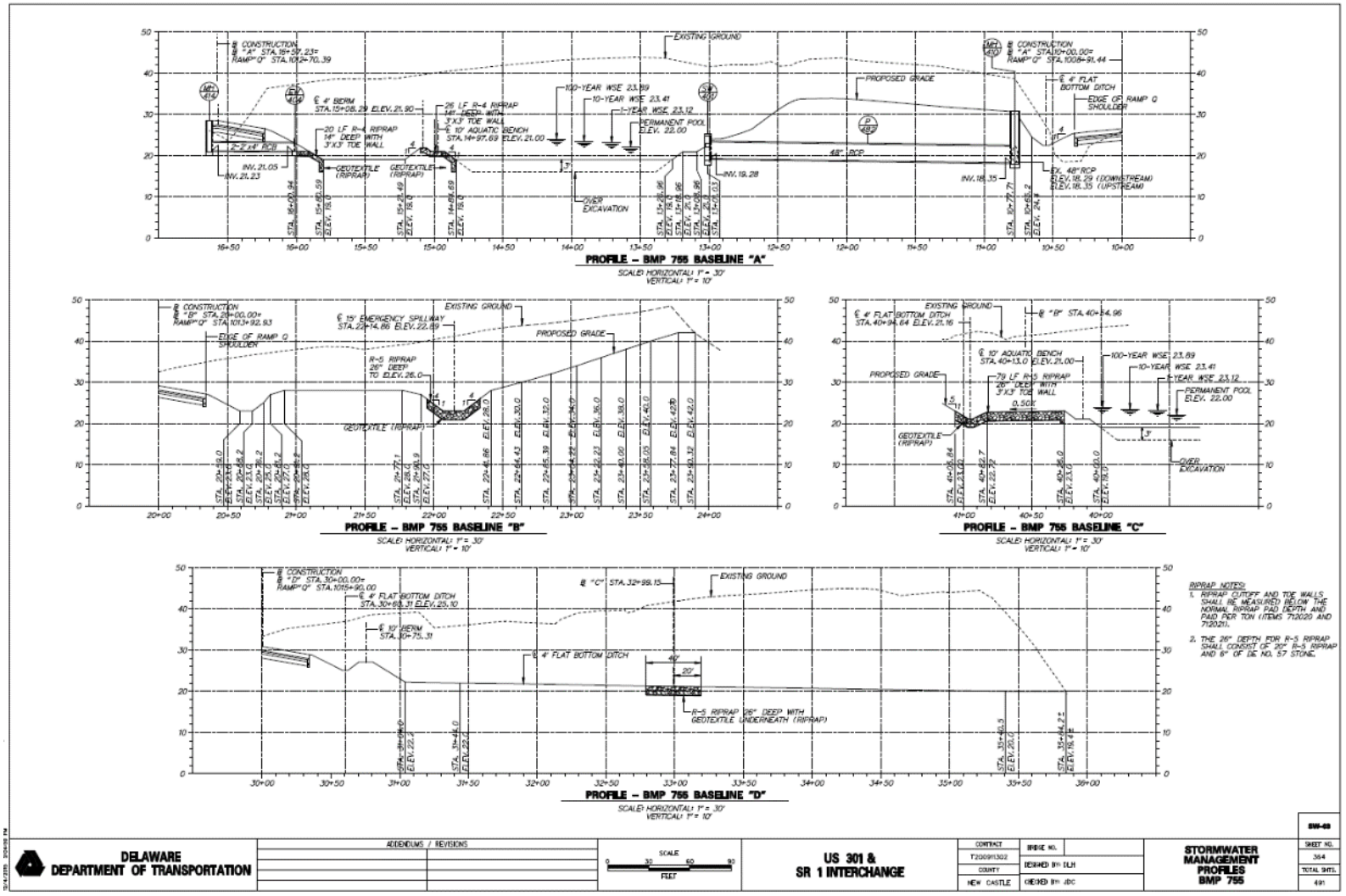
CONTRACT T200911302 | COUNTY NEW CASTLE | BRIDGE NO. | DESIGNED BY: C.R.H. | CHECKED BY: D.L.H.

STORMWATER MANAGEMENT STAKEOUT PLAN BMP 755

SHEET NO. SW-02 | 363 | TOTAL SHTS. 491

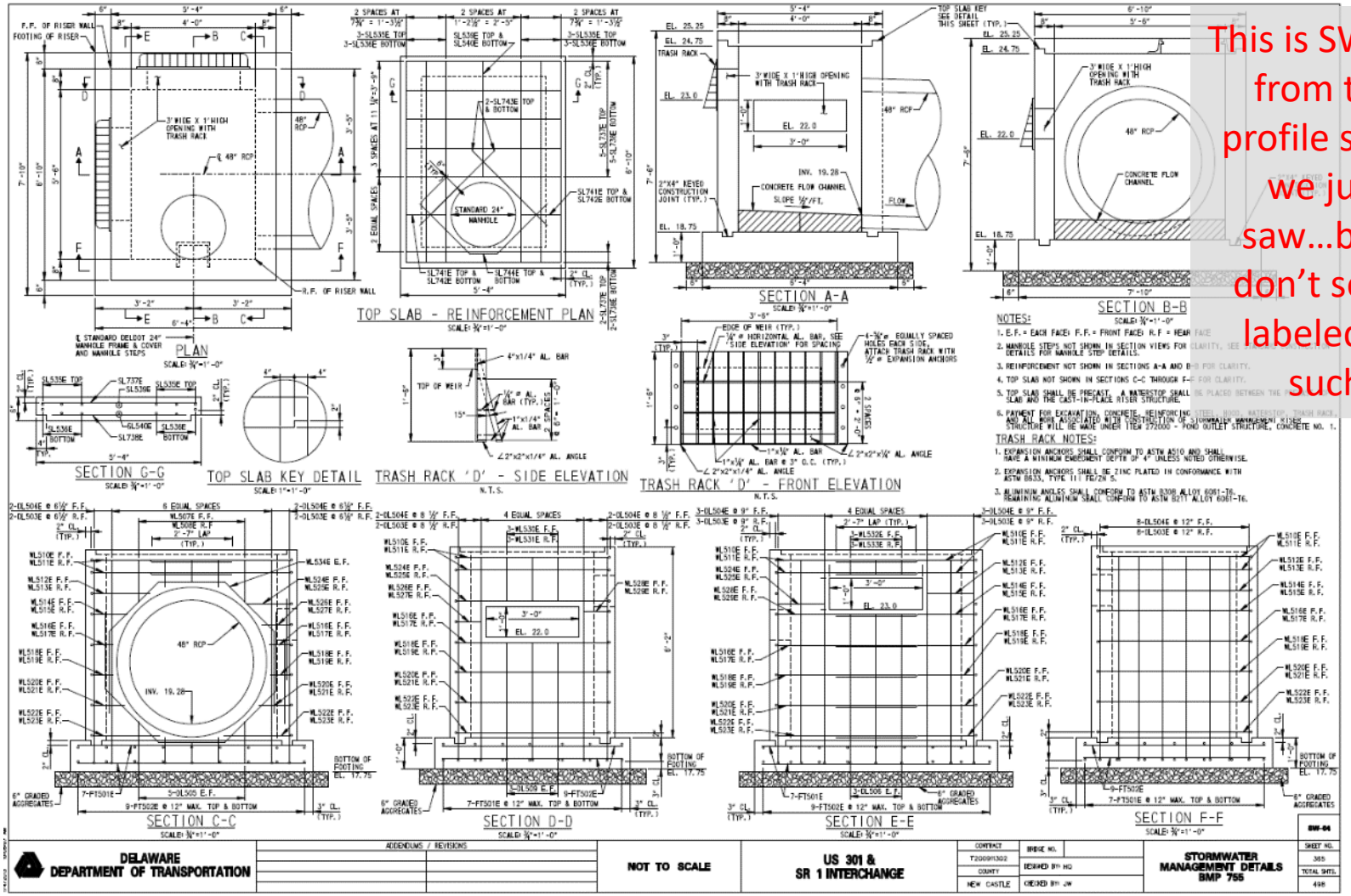
Delaware T²/LTAP

Stormwater Plans



Delaware T²/LTAP

Stormwater Plans



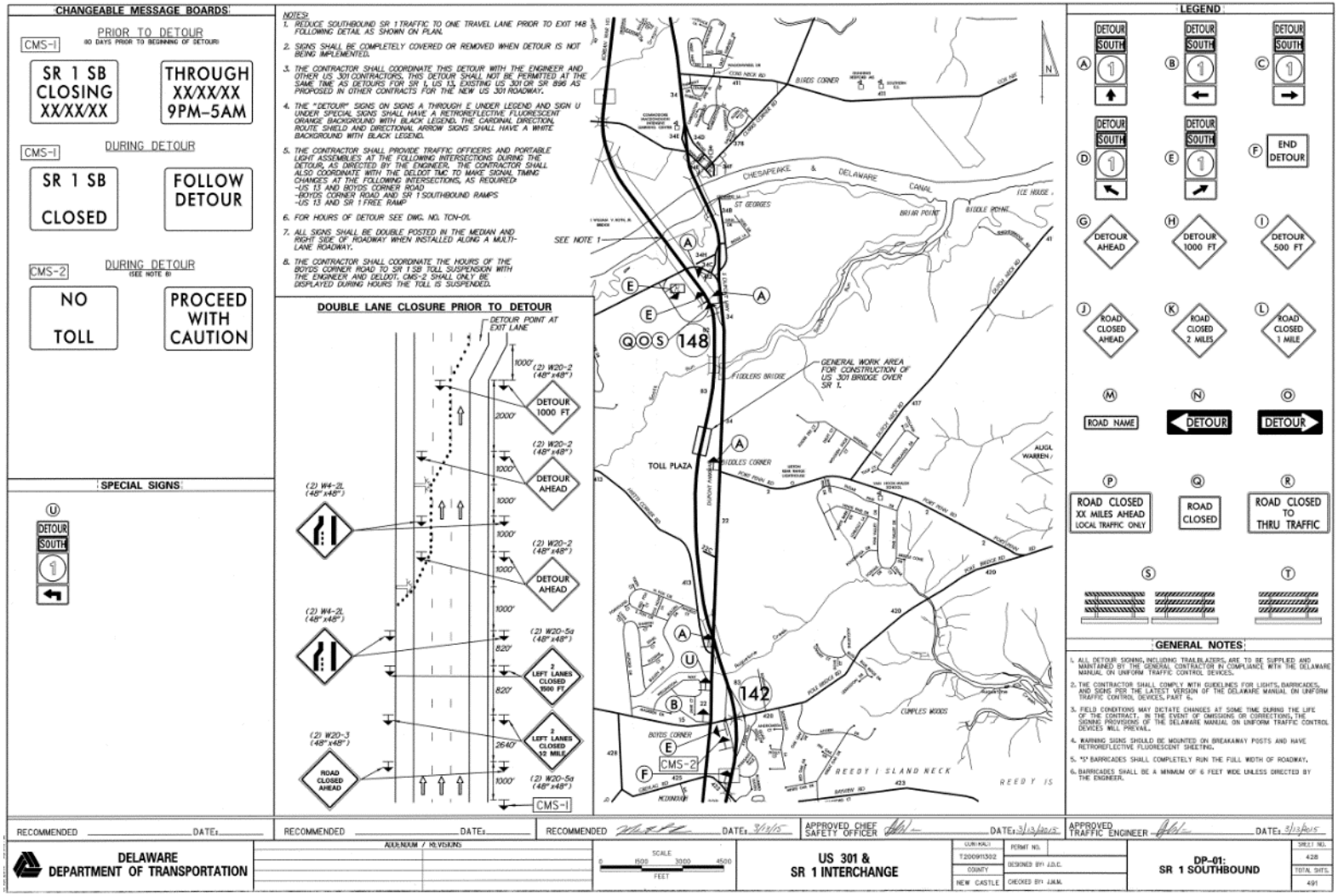
This is SW 401 from the profile sheet we just saw…but I don't see it labeled as such

Delaware T²/LTAP

Traffic Control Plans

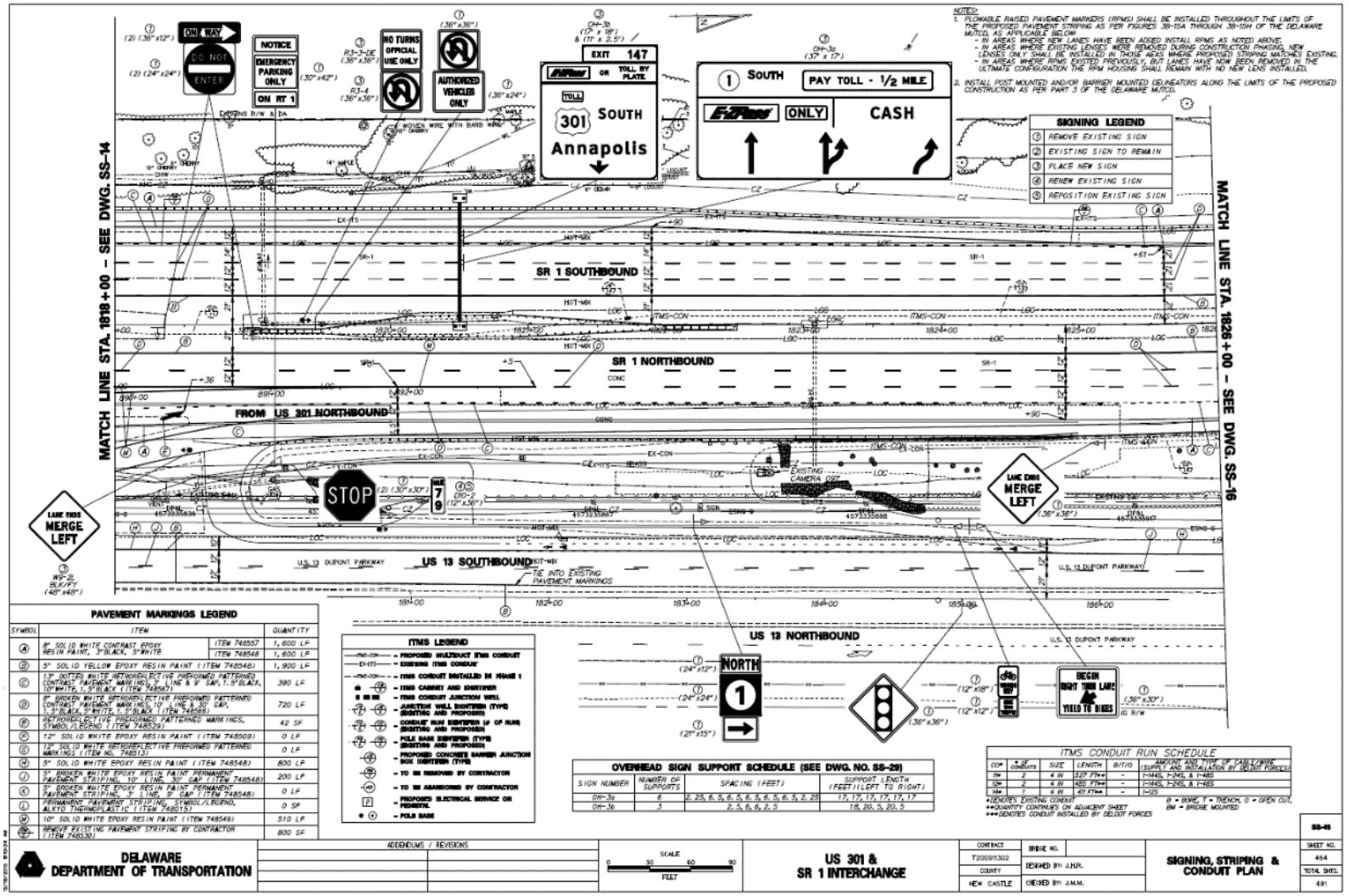
- Very detailed plans
- Lots and lots of notes
- Signs and pavement markings shown overtop of construction plans
- Traffic phasing

Detour Plan



Delaware T²/LTAP

Signing, Striping, … Plans



PAVEMENT MARKINGS LEGEND

SYMBOL	ITEM		QUANTITY
A	8" SOLID WHITE CONTRAST EPOXY RESIN PAINT, 3"BLACK, 5"WHITE	(ITEM 748557) (ITEM 748548)	1,600 LF
B	5" SOLID YELLOW EPOXY RESIN PAINT (ITEM 748548)		1,900 LF
C	12" DOTTED WHITE RETROREFLECTIVE ENDORSED PATTERNED CONTRAST PAVEMENT MARKING, 10' LINE & 30' GAP, 1.5"BLACK, 10"WHITE, 1.5"BLACK (ITEM 748567)		390 LF
D	8" BROKEN WHITE RETROREFLECTIVE PREFORMED PATTERNED CONTRAST PAVEMENT MARKING, 10' LINE & 30' GAP, 1.5"BLACK, 5"WHITE, 1.5"BLACK (ITEM 748568)		720 LF
E	RETROREFLECTIVE PREFORMED PATTERNED MARKINGS, SYMBOL/LEGEND (ITEM 748529)		42 SF
F	12" SOLID WHITE EPOXY RESIN PAINT (ITEM 748509)		0 LF
G	12" SOLID WHITE RETROREFLECTIVE PREFORMED PATTERNED MARKINGS (ITEM NO. 748513)		0 LF
H	5" SOLID WHITE EPOXY RESIN PAINT (ITEM 748548)		800 LF
J	5" BROKEN WHITE EPOXY RESIN PAINT PERMANENT PAVEMENT STRIPING, 10' LINE, 30' GAP (ITEM 748548)		200 LF
K	5" BROKEN WHITE EPOXY RESIN PAINT PERMANENT PAVEMENT STRIPING, 3' LINE, 9' GAP (ITEM 748548)		0 LF
L	PERMANENT PAVEMENT STRIPING, SYMBOL/LEGEND, ALKYD THERMOPLASTIC (ITEM 748513)		0 SF
M	10" SOLID WHITE EPOXY RESIN PAINT (ITEM 748549)		510 LF
N	REMOVE EXISTING PAVEMENT STRIPING BY CONTRACTOR (ITEM 748530)		800 SF

ITMS LEGEND

- PROPOSED MULTIDUCT ITMS CONDUIT
- EXISTING ITMS CONDUIT
- ITMS CONDUIT INSTALLED IN PHASE 1
- ITMS CABINET AND SHELTER
- ITMS CONDUIT JUNCTION WELL
- JUNCTION WELL SHELTER (TYP2) (EXISTING AND PROPOSED)
- CONDUIT RUN SHELTER (# OF RUNS) (EXISTING AND PROPOSED)
- POLE BASE SHELTER (TYP2) (EXISTING AND PROPOSED)
- PROPOSED CONCRETE BARRIER JUNCTION BOX (SHELTER) (TYP2)
- TO BE REMOVED BY CONTRACTOR
- TO BE ABANDONED BY CONTRACTOR
- PROPOSED ELECTRICAL SERVICE OR PEDESTAL
- POLE BASE

OVERHEAD SIGN SUPPORT SCHEDULE (SEE DWG. NO. SS-29)

SIGN NUMBER	NUMBER OF SUPPORTS	SPACING (FEET)	SUPPORT LENGTH (FEET) (LEFT TO RIGHT)
OH-3a	6	2, 25, 6, 5, 6, 5, 6, 5, 6, 5, 6, 5, 2, 25	17, 17, 17, 17, 17, 17
OH-3b	3	2, 5, 6, 6, 2, 3	15, 20, 5, 20, 5

ITMS CONDUIT RUN SCHEDULE

CON*	# OF CONDUITS	SIZE	LENGTH	BIT/D	AMOUNT AND TYPE OF CABLE/WIRE (SUPPLY AND INSTALLATION BY DELDOT FORCES)
ITM	2	4 IN	327 FT**	-	1-#4/0, 1-#2/0, & 1-#4/0
104	2	4 IN	420 FT**	-	1-#4/0, 1-#2/0, & 1-#4/0
104	1	4 IN	40 FT**	-	1-12/0

*DENOTES EXISTING CONDUIT
**QUANTITY CONTINUES ON ADJACENT SHEET
***DENOTES CONDUIT INSTALLED BY DELDOT FORCES

B = BORE, T = TRENCH, O = OPEN CUT, BM = BRIDGE MOUNTED

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

SCALE 0 30 60 90 FEET

US 301 & SR 1 INTERCHANGE

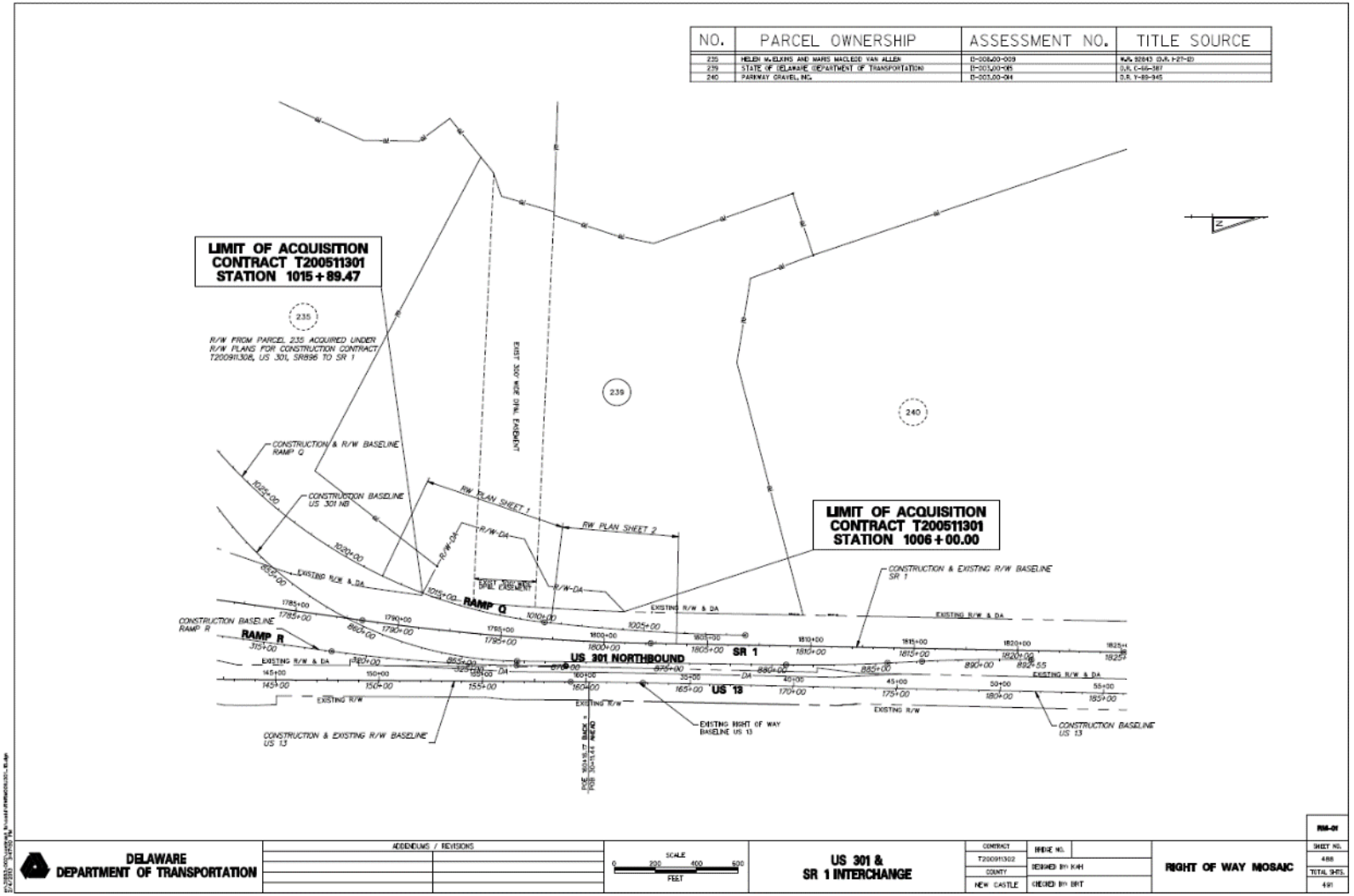
CONTRACT	BRIDGE NO.
T200913302	DESIGNED BY: A.H.R.
COUNTY	DRAWN BY:
NEW CASTLE	CHECKED BY: A.M.M.

SIGNING, STRIPING & CONDUIT PLAN

SHEET NO. 484
TOTAL SHTS. 491

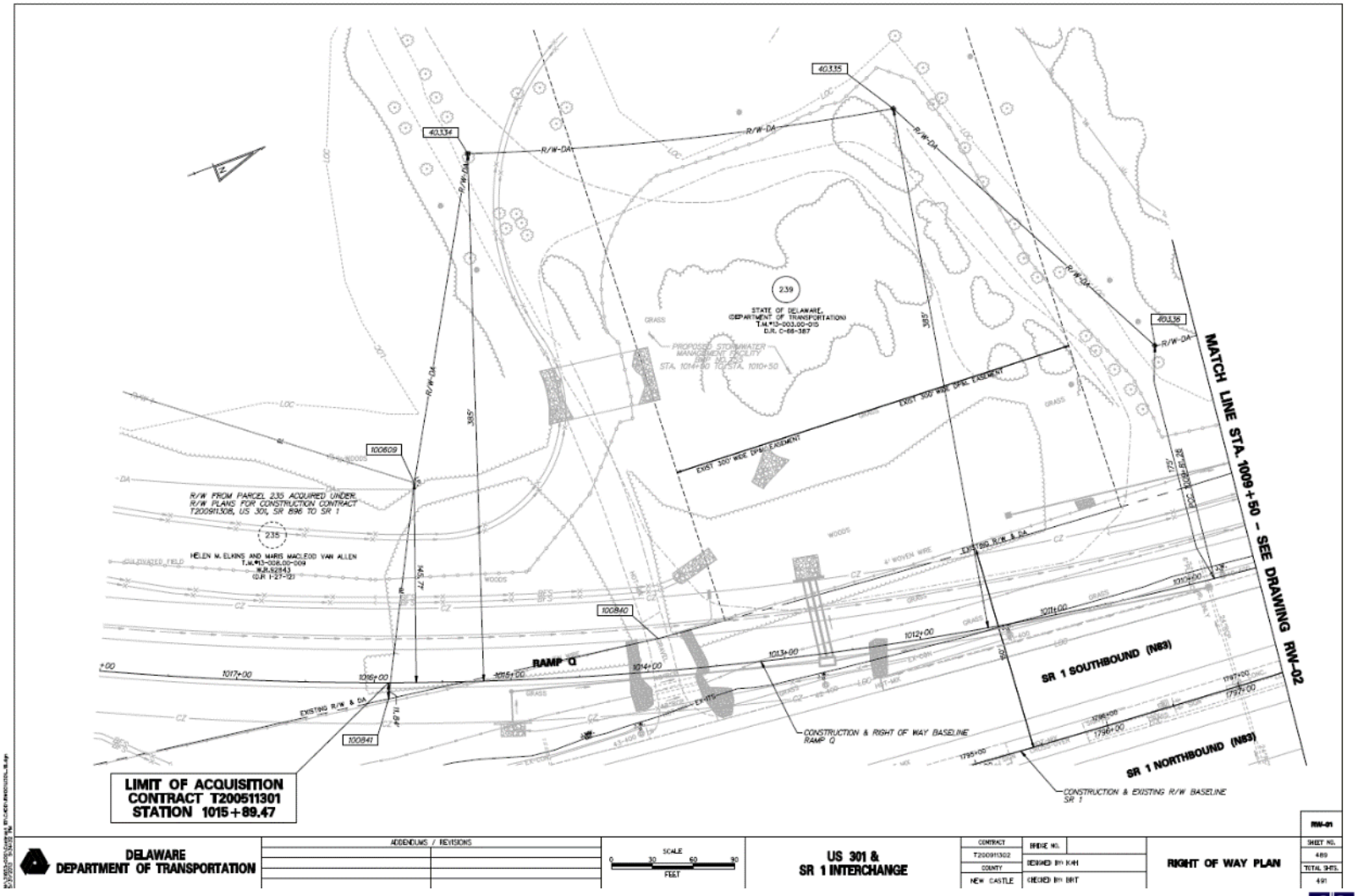
Delaware T²/LTAP

Right of Way



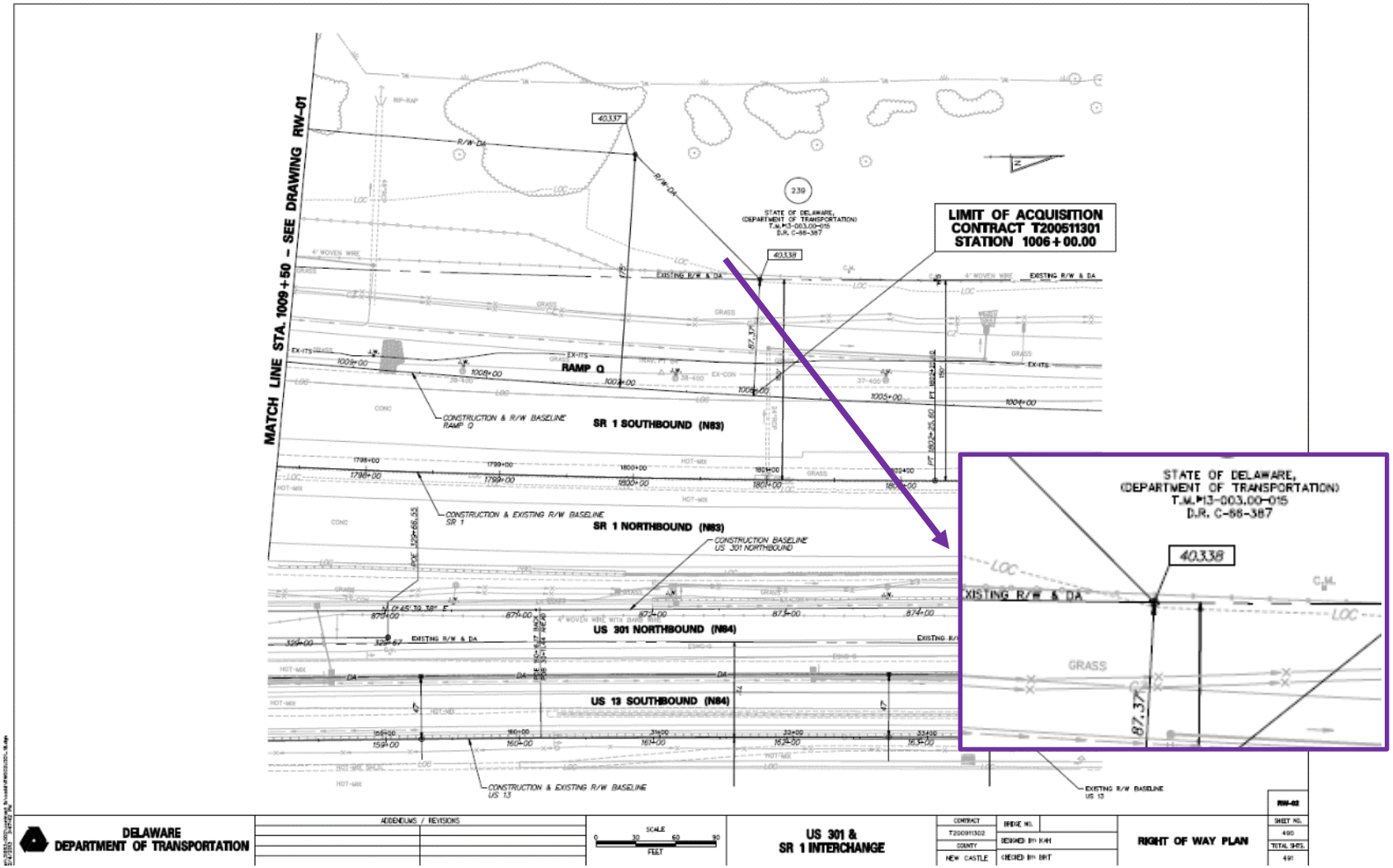
Delaware T²/LTAP

Right of Way



Delaware T²/LTAP

Right of Way



Delaware T²/LTAP

Right of Way

ASSESSMENT NUMBER	OWNERSHIP OF RECORD	TYPE OF ACQUISITION	TITLE SOURCE	PARCEL AREA (ACRES)
13-003.00-015	(230) STATE OF DELAWARE, (DEPARTMENT OF TRANSPORTATION)	FEE	D.R. C-66-387	81.138

ALIGNMENT NUMBER & DESCRIPTION: 1000 - RAMP G

PT. NO.	ALIGN. NO.	STATION	OFFSET *	NORTH	EAST	BEARING	DISTANCE	CHORD BEARING	CHORD LENGTH	ARC LENGTH	RADIUS **
100600	1000	1015+68.14	145.71	557558.9940	590088.9694	N 60°05'28.71" W	243.2577				
40334	1000	1015+20.00	385.00	557680.2870	589878.1085			N 14°38'41.65" E	311.8002	312.0943	-2075.0000
40335	1000	1011+50.00	385.00	557981.9571	589956.9400	N 62°54'27.87" E	357.6795				
40336	1000	1009+81.26	175.00	558099.3107	590186.3460			N 5°37'25.67" E	276.4766	276.4852	-10125.0000
40337	1000	1007+00.00	175.00	558374.4365	590213.4390	N 46°09'17.29" E	132.0047				
40338	1000	1006+00.00	87.37	558465.8978	590308.6453			S 3°42'17.80" W	782.5230	782.6781	11424.7300
100640	1000	1013+90.61	23.81	557685.0101	590258.0779	S 8°03'55.71" W	201.2994				
100641	1000	1015+69.47	-11.84	557485.7019	590229.8348	N 62°30'43.47" W	158.7915				
100600	1000	1015+68.14	145.71	557558.9940	590088.9694						

FIGURE 4123000 AREA = 199915.0647 SQ. FT. (4.5894 ACRES)

COUNTY ASSESSMENT PARCEL NUMBER	PLAN SHEET NUMBER	OWNERSHIP OF RECORD	TITLE SOURCE	PROPERTY AREA BEFORE ACQUISITION (ACRE) D=DEED C=CALCULATED A=ASSESSMENT	ACQUISITION CODE FEE, R/W, P/E, TCE	AREA TO BE ACQUIRED: ACQUISITION (SQ. FEET /ACRES)	AREA TO BE ACQUIRED: AREA OCCUPIED BY EXISTING RIGHT OF WAY (SQ. FEET /ACRES)	AREA TO BE ACQUIRED: EASEMENT: PERMANENT (SQ. FEET /ACRES)	AREA TO BE ACQUIRED: EASEMENT	PROPERTY AREA REMAINING (SQ. FEET /ACRES)	DEED RECORD OF ACQUISITION	REMARKS
13-003.00-015	-	(230) STATE OF DELAWARE, (DEPARTMENT OF TRANSPORTATION)	D.R. C-66-387	C - 81.14	FEE	199915.0647 / 4.59				3334434.9706 / 76.55		SWP 4755
												DTRL EASEMENT FEE 97485.85 SF/2.238 AC

ACQUISITION CODES

FEE - ACQUISITION
R/W - AREA OCCUPIED BY EXISTING R/W
P/E - PERMANENT EASEMENT
TCE - TEMPORARY EASEMENT

LEGEND

RB-01

DELAWARE DEPARTMENT OF TRANSPORTATION

ADDENDUMS / REVISIONS

NOT TO SCALE

US 301 & SR 1 INTERCHANGE

CONTRACT	BRIDGE NO.
T200911302	DESIGNED BY: KAH
COUNTY	
NEW CASTLE	CHECKED BY: BRT

RIGHT-OF-WAY DATA AND TABULATION SHEET

SHEET NO. 491

TOTAL SHTS. 491

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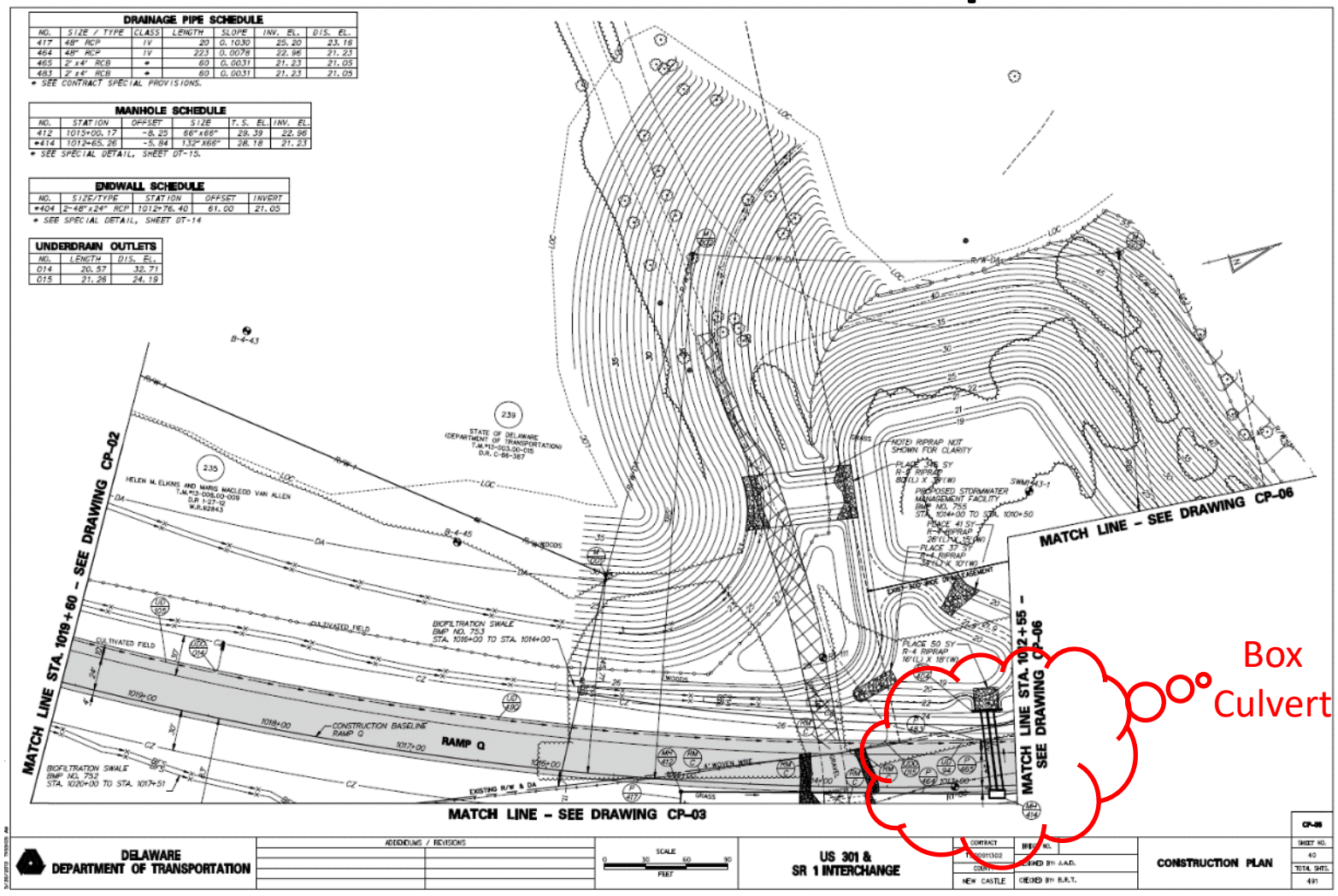
How We Use the Plans

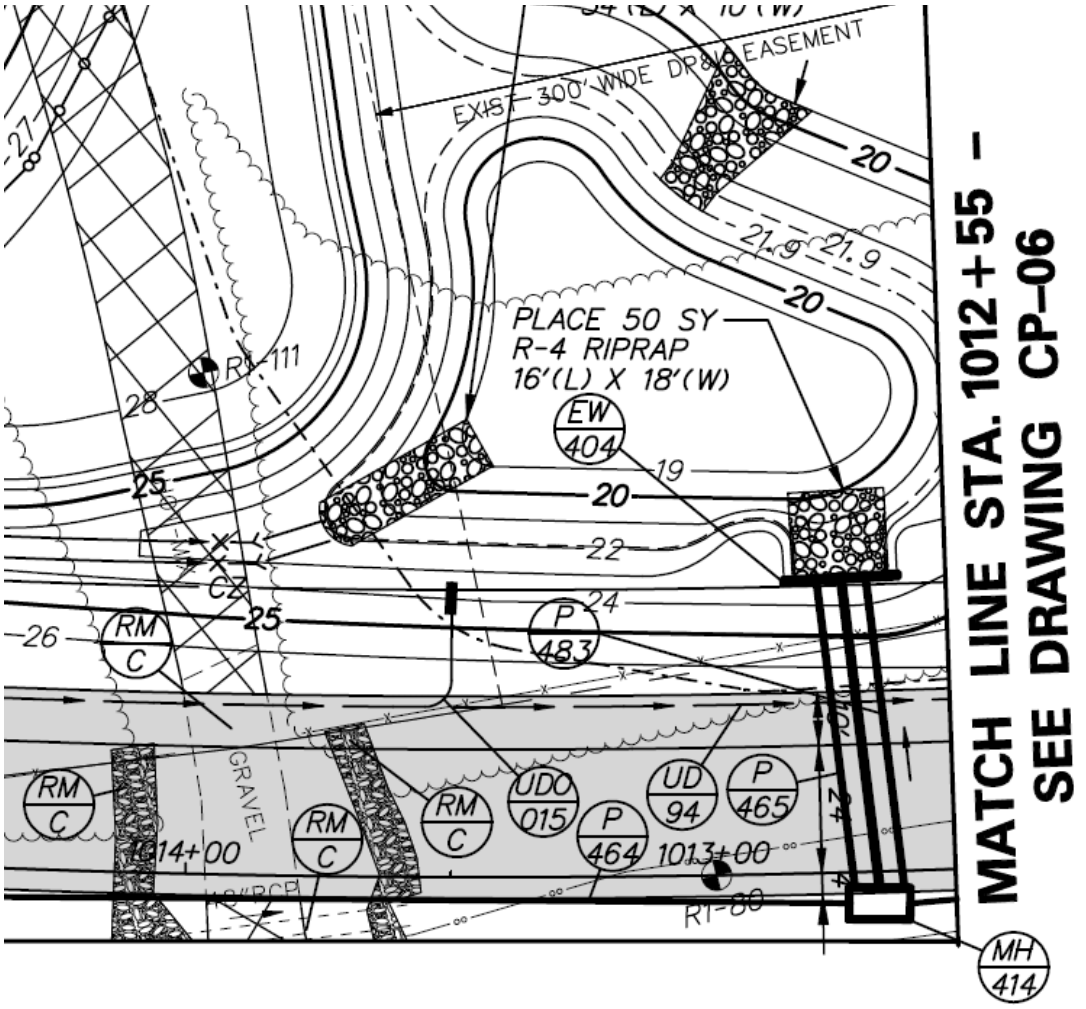
- We'll use a box culvert example to illustrate how we use various parts of the Contract Drawings and the Working Drawings (shop drawings).

Box Culvert Example



Box Culvert Example

- Endwall 404
- Pipe P465
- Manhole 414
- ~Sta. 1012+75?
- On Ramp Q



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Box Culvert Example

- Endwall 404
- Pipe P465
- Manhole 414
- What's this?
  - Special Detail?
  - Sheet DT-14?
  - That's on the Construction Details

DRAINAGE PIPE SCHEDULE

NO.	SIZE / TYPE	CLASS	LENGTH	SLOPE	INV. EL.	DIS. EL.
417	48" RCP	IV	20	0.1030	25.20	23.16
464	48" RCP	IV	223	0.0078	22.96	21.23
465	2' x4' RCB	*	60	0.0031	21.23	21.05
483	2' x4' RCB	*	60	0.0031	21.23	21.05

* SEE CONTRACT SPECIAL PROVISIONS.

MANHOLE SCHEDULE

NO.	STATION	OFFSET	SIZE	T.S. EL.	INV. EL.
412	1015+00.17	-8.25	66"x66"	29.39	22.96
*414	1012+65.26	-5.84	132"X66"	28.18	21.23

* SEE SPECIAL DETAIL, SHEET DT-15.

ENDWALL SCHEDULE

NO.	SIZE/TYPE	STATION	OFFSET	INVERT
*404	2-48"x24" RCP	1012+76.40	61.00	21.05

* SEE SPECIAL DETAIL, SHEET DT-14

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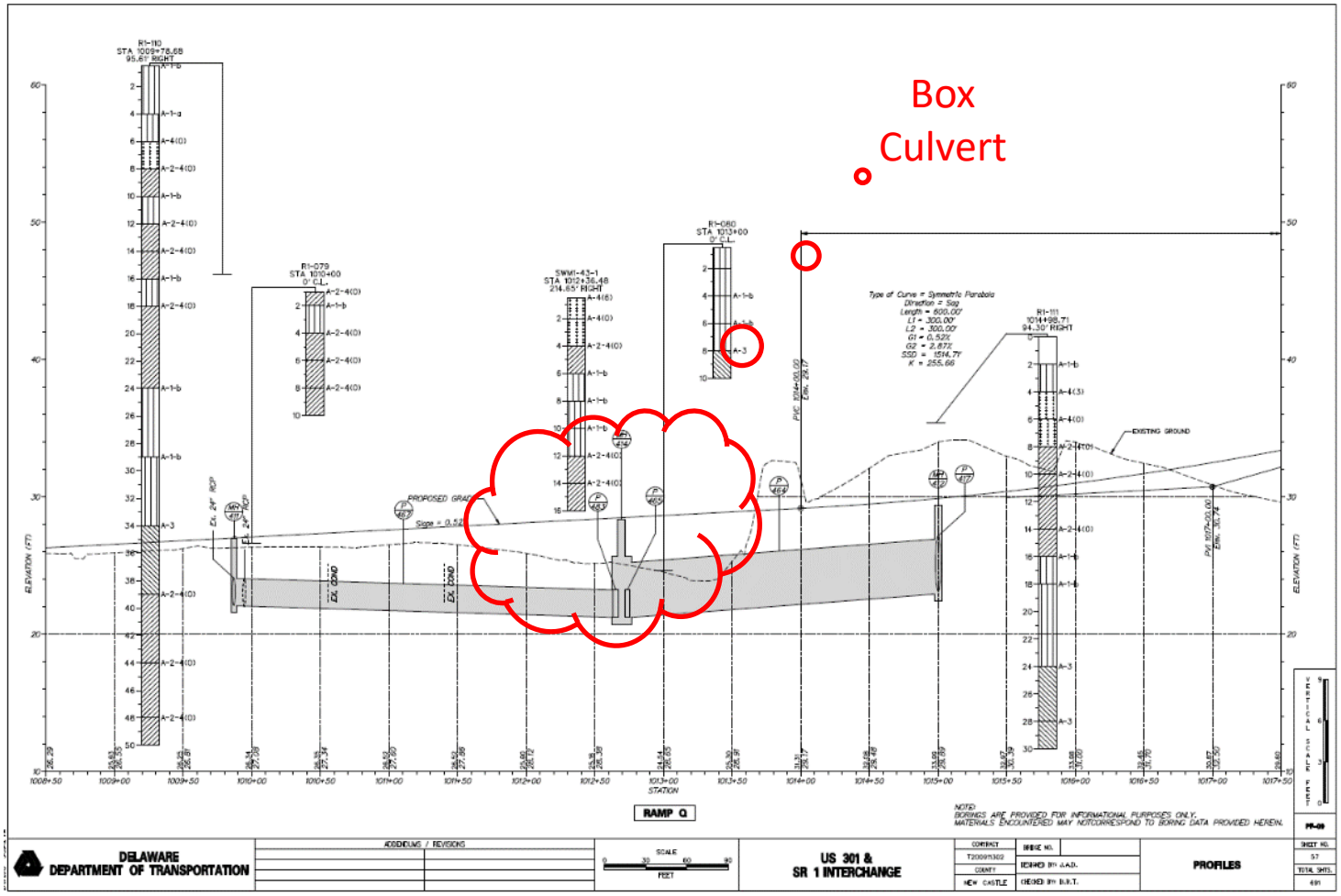
Box Culvert Example



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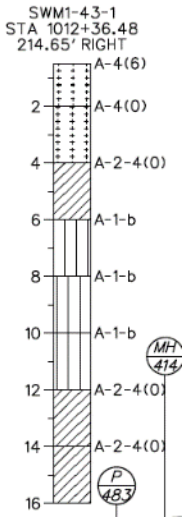
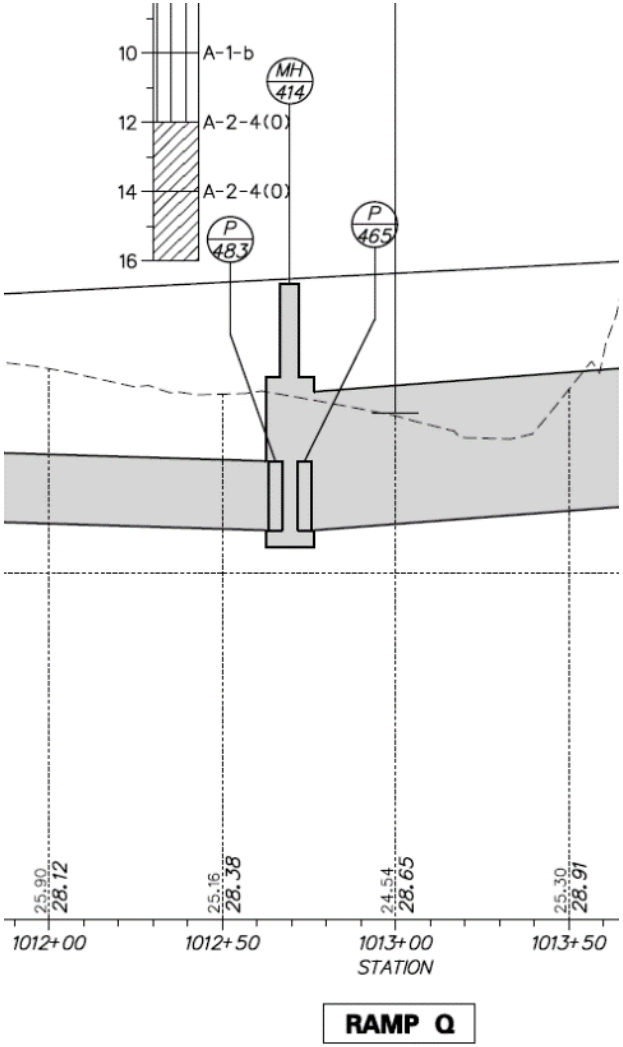
Box Culvert Example

- More like Sta. 1012+40?
- Existing and proposed grades
- Soil boring close by – Sta. 1012+36.48





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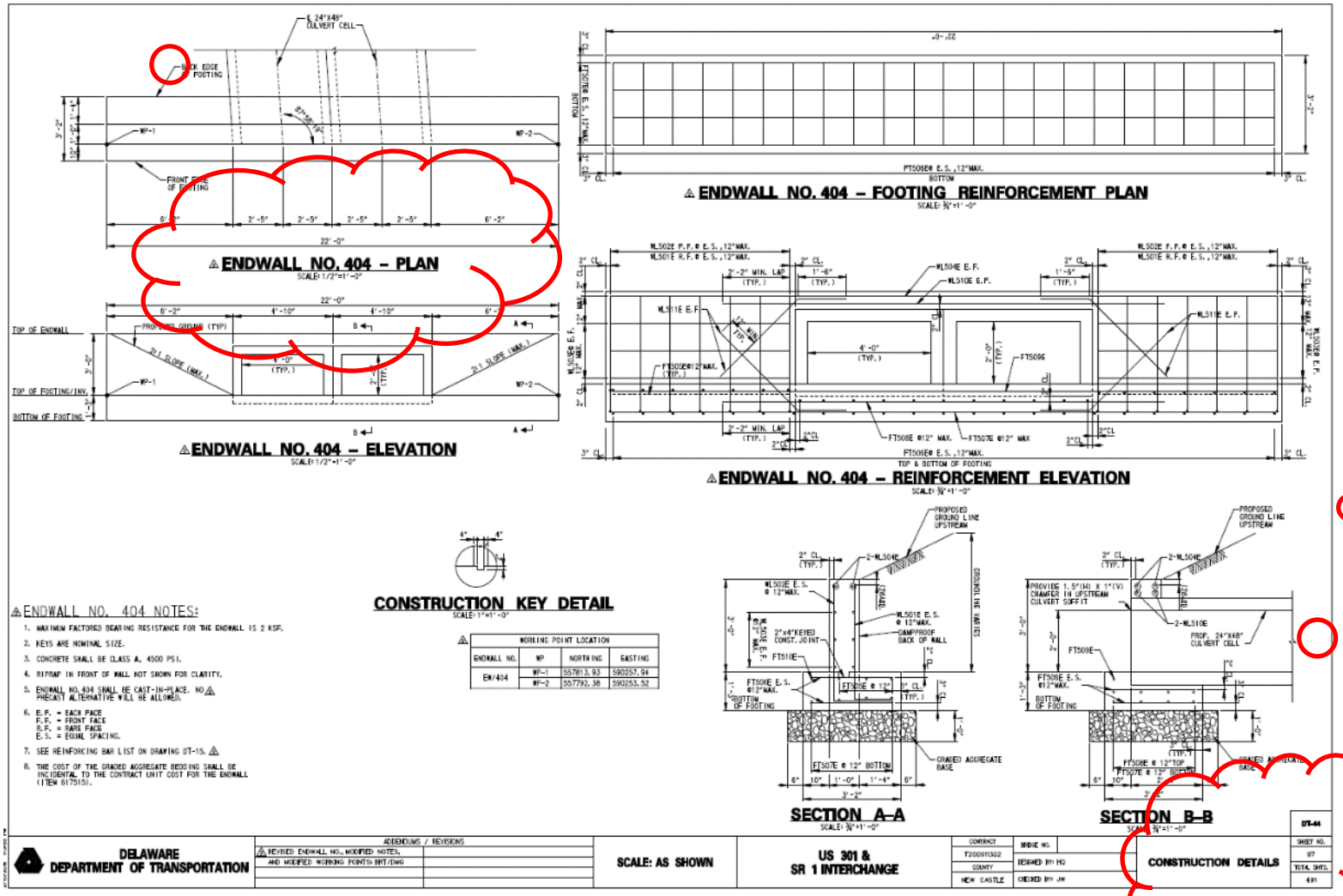
Endwall 404…We've been looking for you

Box Culvert Example



DT-14

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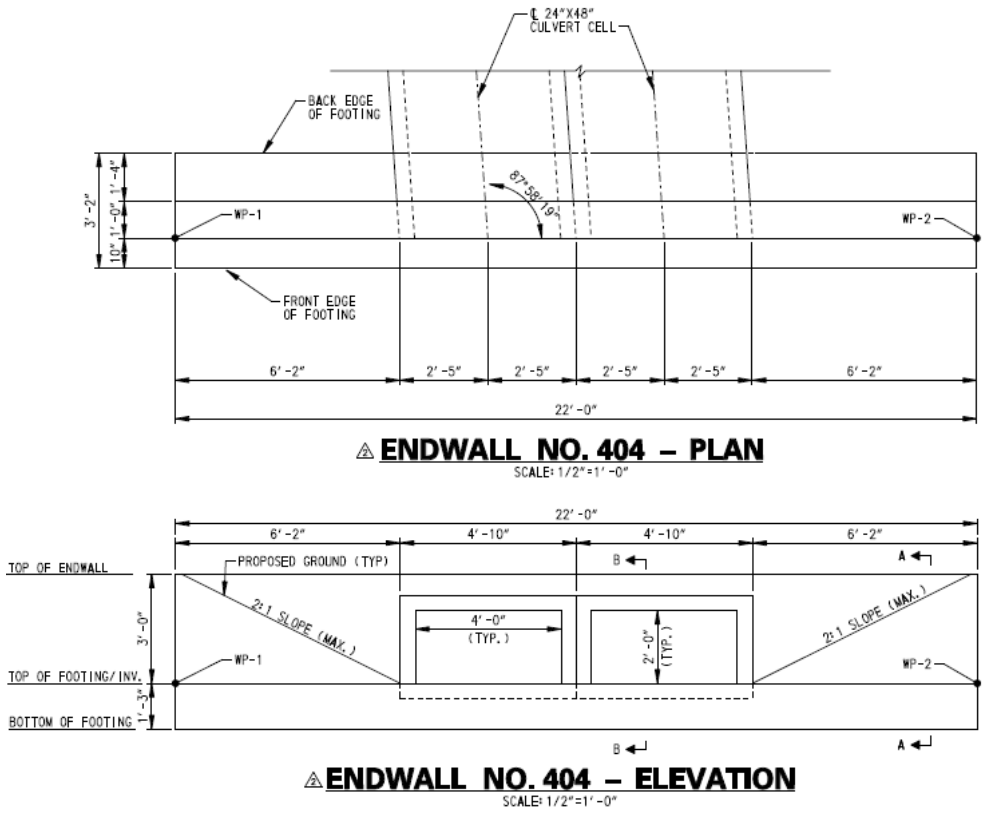
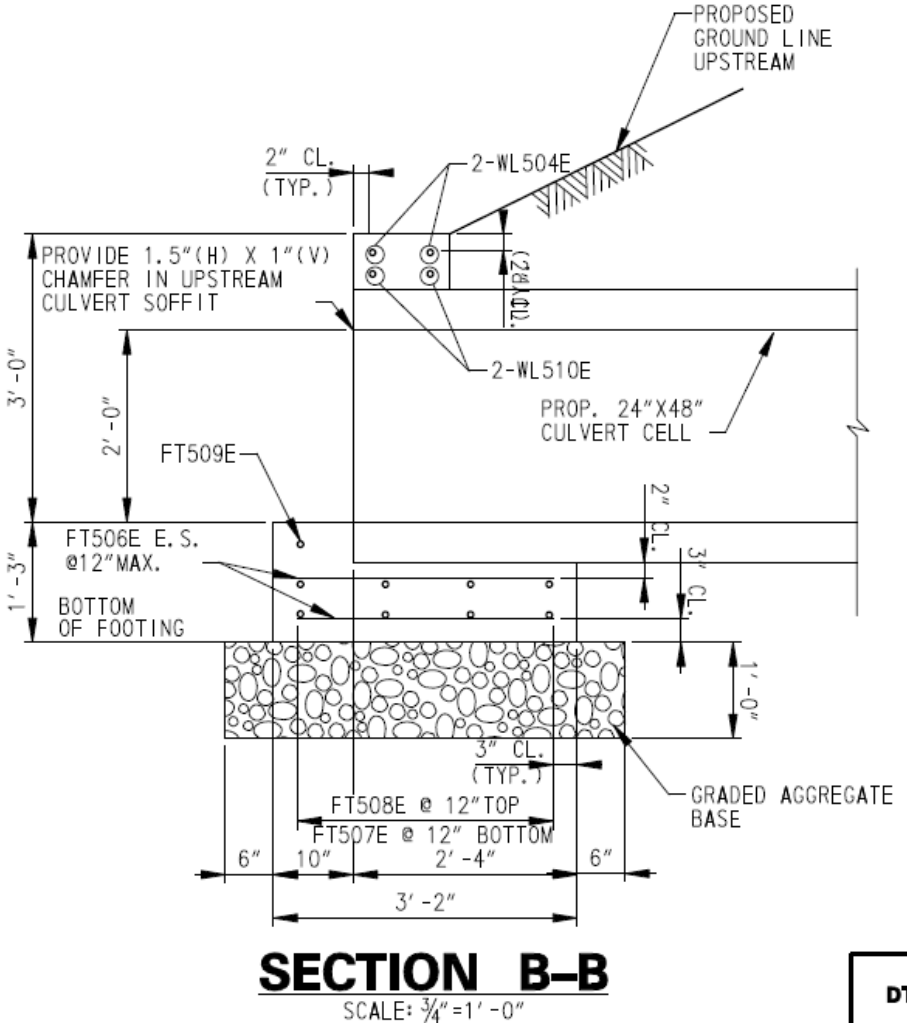
Box Culvert Example

- 3’-2” x 22’ footer
  - 1’-3” thick/deep
- Twin boxes
  - 2’ H x 4’ W
  - Skewed 87°58’19”



Box Culvert Example

- 12” GAB
- Some rebar detail



SECTION B–B

SCALE: 3/4"=1'-0"

DT-14

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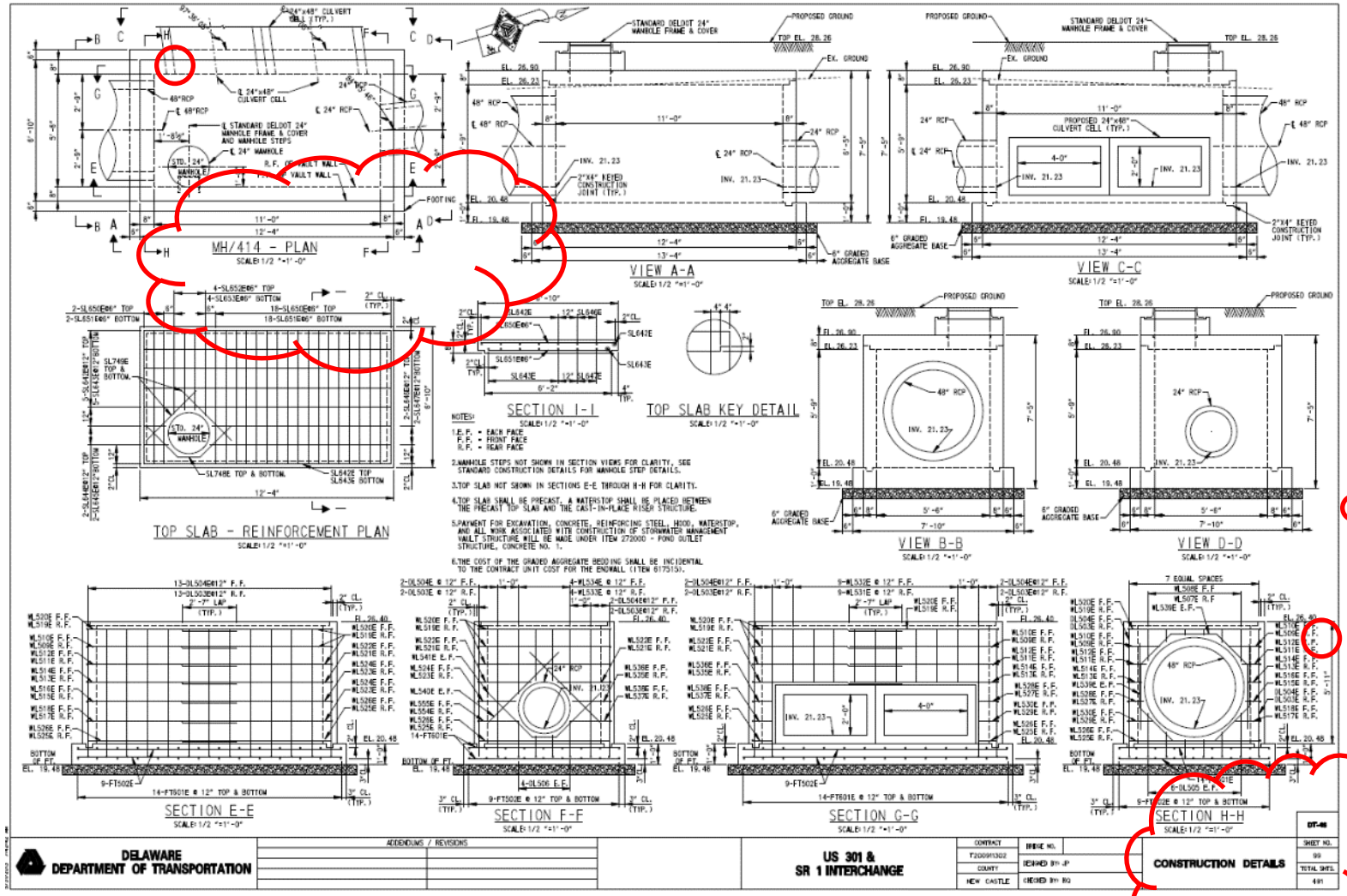
MH 414…There you are

Box Culvert Example



DT-16

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Box Culvert Example

- Let's compare the Contract Drawings to the Shop Drawings
  - Shared culpability? Gillespie Precast submits to Tutor Perini submits to WRA submits to RK&K
    - Who sealed it?
  - Level of detail in shop drawing versus plans

Box Culvert Example

- Think of shop drawings like this
  - Contractor (subcontractor, precaster, vendor)
    - We looked at your plans and specifications and this is what we plan to deliver to you; we assert that it is compliant with your requirements
  - Owner (Owner's representative)
    - Agreed
- Once this exchange is complete, the shop drawing becomes the standard for acceptance

Questions?

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