# SECTION I - BARRIER

SHEET NO. NAME


B-L (2001) – BARRIER LEGEND
B-1 – GUARDRAIL APPLICATIONS
(2004) - 1 PLANS - (TYPE 1, TYPE 2, AND TYPE 3)
(2004) - 2 ELEVATIONS AND SPLICE DETAIL
(2002) - 3 SECTION VIEWS
(2002) - 4 GRADING FOR GUARDRAIL END TREATMENT, TYPE 1
(2002) - 5 GRADING FOR GUARDRAIL END TREATMENT, TYPE 2
(2002) - 6 GRADING FOR GUARDRAIL END TREATMENT, TYPE 3
B-2 (2004) – GUARDRAIL OVER CULVERTS, TYPE 1
B-3 (2004) – GUARDRAIL OVER CULVERTS, TYPE 2
B-4 (2004) – CURVED GUARDRAIL SECTION
B-5 (2002) – END ANCHORAGE
B-6 – BURIED END SECTION
(2002) - 1 BURIED END SECTION
(2002) - 2 BURRIED END SECTION
(2002) - 3 POST, CONCRETE BLOCK, & RUBRAIL ANCHOR DETAILS
B-7 – GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1
(2005) - 1 PLAN, ELEVATION, AND SECTIONS
(2001) - 2 WOOD BLOCKOUT, RUB RAIL WOOD BLOCKS, BEARING PLATE, RUB RAIL TO BARRIER CONNECTION DETAILS
(2001) - 3 BENT PLATE RUB RAIL DETAILS
B-8 – GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 2
(2005) - 1 PLAN, ELEVATION, AND SECTIONS
(2001) - 2 NOTES, BENT RAIL DETAILS, BLOCK SCHEDULE
B-9 (2002) – GUARDRAIL TO BARRIER CONNECTION, EXIT TYPE
B-10 (2004) – BRIDGE RAIL RETROFIT, TYPE 1
B-11 – BRIDGE RAIL RETROFIT, TYPE 2
(2004) - 1 PLAN, SECTION A-A, BASE PLATE DETAIL
(2001) - 2 BASE PLATE DETAIL AND STEEL GUARDRAIL POST
B-12 (2001) – BRIDGE RAIL RETROFIT, TYPE 3
B-13 – HARDWARE
(2004) - 1 W-BEAM DETAILS
(2004) - 2 W-BEAM STEEL POST AND OFFSET BLOCK
(2004) - 3 W-BEAM TERMINAL CONNECTOR
(2004) - 4 THRIE BEAM DETAILS
(2004) - 5 THRIE BEAM STEEL POST AND OFFSET BLOCK
(2004) - 6 W-THRIE BEAM TRANSITION SECTION
(2004) - 7 WOOD BLOCK, SOIL PLATE, SHORT WOOD BREAKAWAY POST, STEEL TUBE, LONG WOOD BREAKAWAY POST
(2004) - 8 SWAGED CABLE AND RELATED HARDWARE ASSEMBLY
(2004) - 9 REFLECTORIZED WASHER AND BEARING PLATE DETAIL
(2004) - 10 GUARDRAIL BOLT & RECESSED NUT
(2004) - 11 5/8" (16) HEX BOLT, HEX NUT, & STEEL WASHER, HIGH-STRENGTH STRUCTURAL HEX BOLT & HEX NUT
(2004) - 12 15/16" (24) HEX NUT & STEEL WASHER, 5/8" (16) CARRIAGE BOLT, HEX NUT, & STEEL WASHER
(2005) - 13 GUARDRAIL MOUNTED RAIL •DETAIL ON HOLD•
B-14 – CONCRETE SAFETY BARRIER (F SHAPE)
(2001) - 1 TYPICAL CAST IN PLACE OR SLIP FORM CONSTRUCTION
(2001) - 2 TYPICAL PRE-CAST CONSTRUCTION
(2001) - 3 SLOTTED PLATE CONNECTION DETAILS


DELAWARE
DEPARTMENT OF TRANSPORTATION

INDEX OF SHEETS (2005)

SHT. 1 OF 5

11/23/2005

# SECTION I - BARRIER (CONT'D)


SHEET NO. NAME

B-15 — PORTABLE CONCRETE SAFETY BARRIER (F SHAPE)

(2001) - 1 PLAN, ELEVATION, AND SECTION VIEW •DETAIL DELETED - SEE SPECIFICATIONS•

(2001) - 2 CURVE SECTION •DETAIL DELETED - SEE SPECIFICATIONS•

(2001) - 3 TAPERED END SECTION •DETAIL DELETED - SEE SPECIFICATIONS•

(2001) - 4 TYPICAL REINFORCEMENT DETAILS •DETAIL DELETED - SEE SPECIFICATIONS•

(2001) - 4 JOINT CONNECTION DETAILS •DETAIL DELETED - SEE SPECIFICATIONS•


# SECTION II - CURB & GUTTER


SHEET NO. NAME

C-1 (2005)— P.C.C. CURB, P.C.C. CURB & GUTTER, AND HOT-MIX CURB

C-2 — CURB RAMPS

(2004) - 1 TYPE 1

(2004) - 2 TYPES 2, 3, & 4

(2004) - 3 SECTIONS FOR TYPES 2, 3, & 4

(2004) - 4 TYPE 5

C-3 (2005)— ENTRANCES

C-4 — CURB OPENINGS

(2001) - 1 TYPES A, B, & C

(2001) - 2 TYPES D & E

(2001) - 3 TYPES F & G


# SECTION III - DRAINAGE


SHEET NO. NAME

D-1 — 6:1 SAFETY END STRUCTURE

(2001) - 1 DETAIL VIEWS

(2001) - 2 SCHEDULES

D-2 — 10:1 SAFETY END STRUCTURE

(2001) - 1 DETAIL VIEWS

(2001) - 2 SCHEDULES

D-3 — SAFETY GRATES

(2005) - 1 SAFETY END STRUCTURE GRATE & ASSEMBLY DETAIL

(2005) - 2 PERSONNEL SAFETY GRATE FOR PIPE INLET DETAIL

D-4 (2002)— INLET BOX DETAILS

D-5 — DRAINAGE INLET DETAILS

(2002) - 1 DRAINAGE INLET ASSEMBLY

(2002) - 2 DRAINAGE INLET FRAME AND GRATES

(2004) - 3 DRAINAGE INLET TOP UNITS

(2002) - 4 DRAINAGE INLET COVER SLAB DETAILS

(2002) - 5 DOUBLE INLET COVER SLAB DETAILS

(2004) - 6 DRAINAGE INLET 34" (865) x 24" (610) DETAILS

(2002) - 7 DRAINAGE INLET 34" (865) x 18" (455) DETAILS

(2002) - 8 LAWN INLET DETAIL

# SECTION III - DRAINAGE (CONT'D)


| SHEET NO. | NAME |
|---|---|
| D-6 | — MANHOLE DETAILS |
| (2001) - 1 | BOX MANHOLE ASSEMBLY |
| (2001) - 2 | ROUND MANHOLE ASSEMBLY |
| (2001) - 3 | MANHOLE FRAME AND COVER |
| (2002) - 4 | BOX MANHOLE COVER SLAB |
| D-7 | — JUNCTION BOX DETAILS |
| (2002) - 1 | JUNCTION BOX ASSEMBLY |
| (2002) - 2 | JUNCTION BOX COVER SLAB |
| D-8 (2001) | — PIPE BEDDING |
| D-9 (2004) | — PERFORATED PIPE UNDERDRAIN |


# SECTION IV - EROSION


| SHEET NO. | NAME |
|---|---|
| E-1 (2001) | — INCREMENTAL STABILIZATION |
| E-2 (2001) | — SILT FENCE |
| E-3 (2005) | — DRAINAGE INLET SEDIMENT CONTROL |
| E-4 (2001) | — CURB INLET SEDIMENT CONTROL |
| E-5 (2001) | — STONE CHECK DAM |
| E-6 (2005) | — SEDIMENT TRAP |
| E-7 (2005) | — SEDIMENT TRAP, USING DRAINAGE INLET AS OUTLET |
| E-8 | — RISER PIPE ASSEMBLY FOR SEDIMENT TRAP |
| (2001) - 1 | ELEVATION |
| (2001) - 2 | TRASH HOOD DETAILS |
| E-9 (2005) | — EROSION CONTROL BLANKET APPLICATIONS |
| E-10 (2005) | — RIPRAP DITCH |
| E-11 (2005) | — TEMPORARY SWALE |
| E-12 (2005) | — PERIMETER DIKE/SWALE |
| E-13 (2005) | — EARTH DIKE |
| E-14 (2005) | — TEMPORARY SLOPE DRAIN |
| E-15 (2005) | — STILLING WELL |
| E-16 (2005) | — SUMP PIT, TYPE 1& 2 |
| E-17 (2005) | — DEWATERING BASIN |
| E-18 (2005) | — GEOTEXTILE-LINED CHANNEL DIVERSION |
| E-19 (2005) | — SANDBAG DIVERSION |
| E-20 (2005) | — SANDBAG DIKE |
| E-21 (2005) | — STABILIZED CONSTRUCTION ENTRANCE |
| E-22 (2001) | — SKIMMER DEWATERING DEVICE |
| E-23 | — TURBIDITY CURTAIN |
| (2005) - 1 | FLOATING TURBIDITY CURTAIN |
| (2005) - 2 | STAKED TURBIDITY CURTAIN |
| E-24 (2005) | — PORTABLE SEDIMENT TANK |
| E-25 (2005) | — TURF REINFORCEMENT MAT APPLICATIONS |

# SECTION V - MISCELLANEOUS


SHEET NO. NAME

M-1 (2001) — RIGHT-OF-WAY FENCE

M-2 (2001) — CONCRETE MONUMENT

M-3 (2005) — REMOVABLE BOLLARD

M-4 (2004) — BIKE RACK

M-5 (2004) — WOOD RAIL FENCE

M-6 (2004) — PATTERNED HOT-MIX OR CONCRETE & BRICK PAVER


# SECTION VI - PAVEMENT


SHEET NO. NAME

P-1 — P.C.C. PAVEMENT

(2001) - 1 SLAB PLAN (WITH DOWEL AND TIE LOCATIONS)

(2004) - 2 JOINT AND SEALANT DETAILS

(2001) - 3 W BOLT, HOOK BOLT, DOWEL & TIE BAR

(2001) - 4 DOWEL SUPPORT BASKET

(2001) - 5 DOWEL & TIE BAR PLACEMENT TOLERANCES

P-2 — P.C.C. PAVEMENT PATCHING

(2001) - 1 FULL DEPTH PATCH, PLAN VIEW

(2004) - 2 FULL DEPTH PATCH, SECTION VIEWS

(2004) - 3 FULL DEPTH PATCH, SEALANT DETAILS, GROUT RETENTION DISK, AND DOWEL BAR

(2001) - 4 FULL DEPTH PATCH, DOWEL BAR PLACEMENT TOLERANCES

(2001) - 5 PARTIAL DEPTH PATCH, PLAN AND SECTION VIEWS


# SECTION VII - TRAFFIC


SHEET NO. NAME

T-1 (2005) — CONDUIT JUNCTION WELL, TYPES 1,2, AND 3

T-2 (2005) — CONDUIT JUNCTION WELL, TYPE 4

T-3 (2005) — CONDUIT JUNCTION WELL, TYPE 5

T-4 (2005) — CABINET BASES (TYPES "M" AND "P")

T-5 — POLE BASES

(2005) - 1 ROUND BASE, SQUARE BASE

(2005) - 2 TYPICAL SECTION (BASES 1, 2, 2A, 2B, 3, 3A, 3B, AND 7), TYPICAL SECTION (BASE 4), TYPICAL INSTALLATION (BASES 1, 2, 2A, 2B, 3, 3A, 3B, 4, AND 7)

(2005) - 3 TYPICAL SECTION (BASES 5 AND 6), ANCHOR BOLT DATA CHART AND DETAILS

T-6 (2005) — SPECIAL POLE BASE

T-7 (2005) — SIGN FOUNDATION

T-8 (2005) — LOOP DETECTOR TO CONDUIT JUNCTION WELL CONNECTION

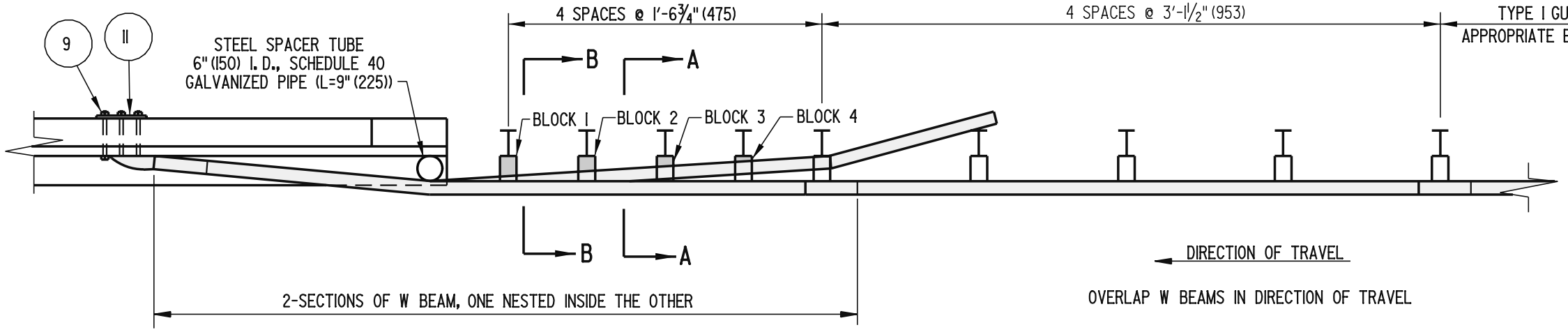
T-9 (2005) — TYPE #1 LOOP DETECTOR

T-10 (2005) — TYPE #2 LOOP DETECTOR

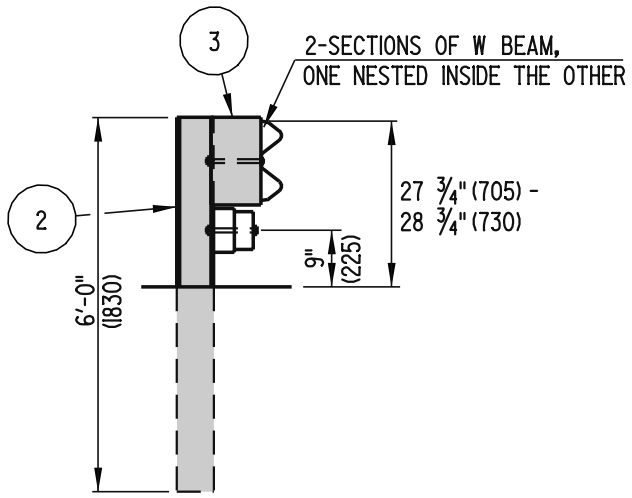
# SECTION VII - TRAFFIC (CONT'D)


| SHEET NO. | NAME |
|---|---|
| T-11 | — MESSENGER WIRE ATTACHMENT |
| (2005) - 1 | INTERMEDIATE MESSENGER WIRE ATTACHMENT ON WOOD POLES |
| (2005) - 2 | ANGULAR INTERMEDIATE MESSENGER WIRE ATTACHMENT |
| T-12 | — MESSENGER WIRE ATTACHMENT |
| (2005) - 1 | SPAN WIRE ATTACHMENT BETWEEN POLES |
| (2005) - 2 | DEAD END MESSENGER WIRE ATTACHMENT |
| T-13 | — CONDUIT JUNCTION WELLS |
| (2005) - 1 | TYPE 6 |
| (2004) - 2 | TYPE 7 |
| (2004) - 3 | TYPES 8 & 10 |
| T-14 | — EMERGENCY PREEMPTION RECEIVER |
| (2004) - 1 | UPRIGHT MOUNT |
| (2005) - 2 | INVERTED MOUNT |

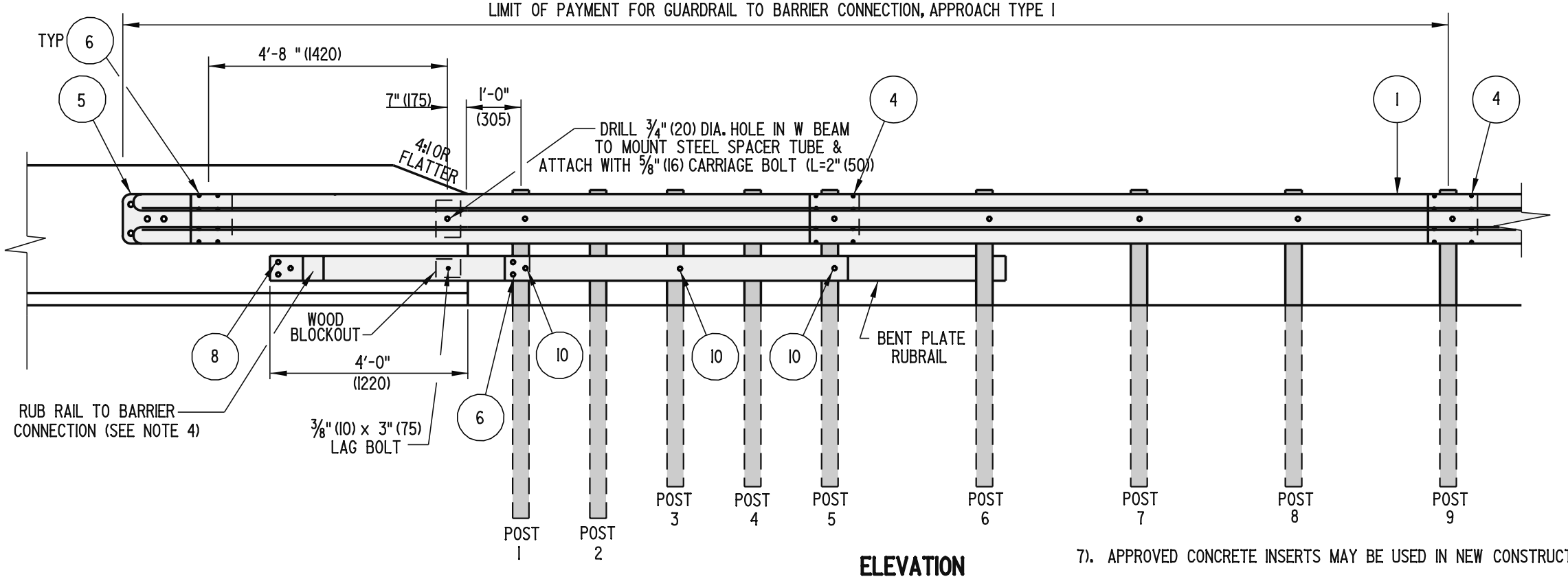
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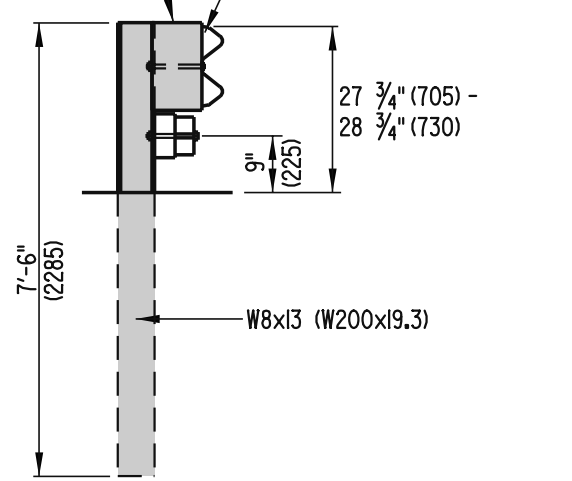

## PLAN




## POSTS NO. 3, 4, & 5 SECTION A-A




## ELEVATION




## POSTS NO. 1&2 SECTION B-B

NOTES:
1). W BEAM IS NOT BOLTED TO POSTS AT POSTS 2 THROUGH 4.
2). RUB RAIL IS NOT BOLTED AT POSTS 2 AND 4.
3). POSTS 1 THROUGH 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH LOWER WOOD BLOCKS AND/OR RUBRAIL AND WOOD BLOCK.
4). USE APPROPRIATE EPOXY BOLT ANCHORS TO REDUCE THE CHANCE OF SPLITTING THE CONCRETE. PLACE STEEL WASHERS (FOR 5/8" (16) BOLT) BETWEEN BOLT HEADS AND RUB RAIL.
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTOR TO PARAPET.
8). POSTS 1& 2 ARE W8x13 (W200x19.3). ALL OTHER POSTS IN TRANSITION ARE W6x9 (W150x13.5).

7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION

DELAWARE
DEPARTMENT OF TRANSPORTATION

GUARDRAIL TO BARRIER CONNECTION, APPROACH TYPE 1

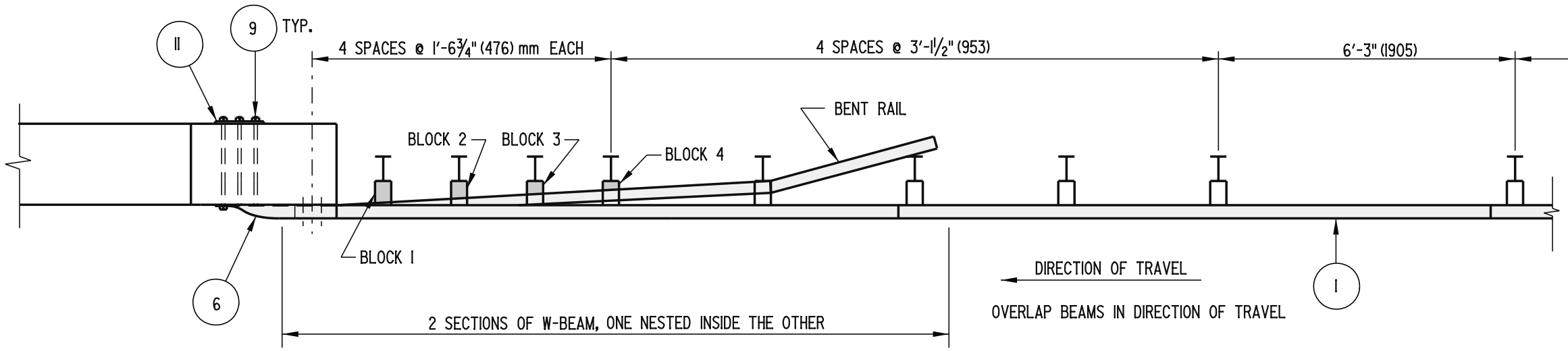
STANDARD NO. B-7 (2004) | SHT. 1 OF 3

APPROVED Carolann Wicks (CHIEF ENGINEER) 12/5/05 (DATE)

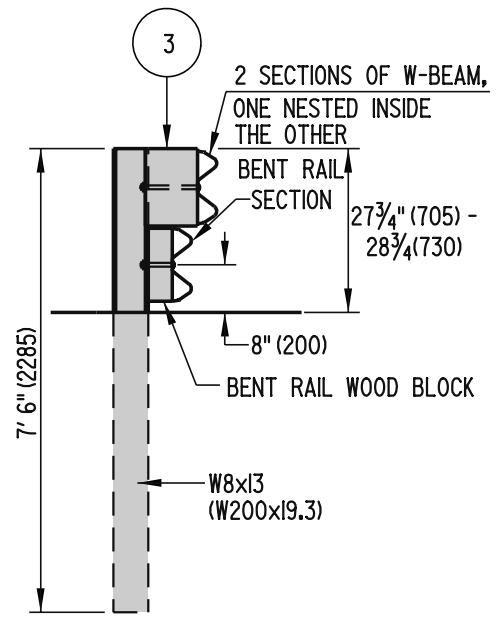
RECOMMENDED (DESIGN ENGINEER) 11/29/05 (DATE)

08/08/2005

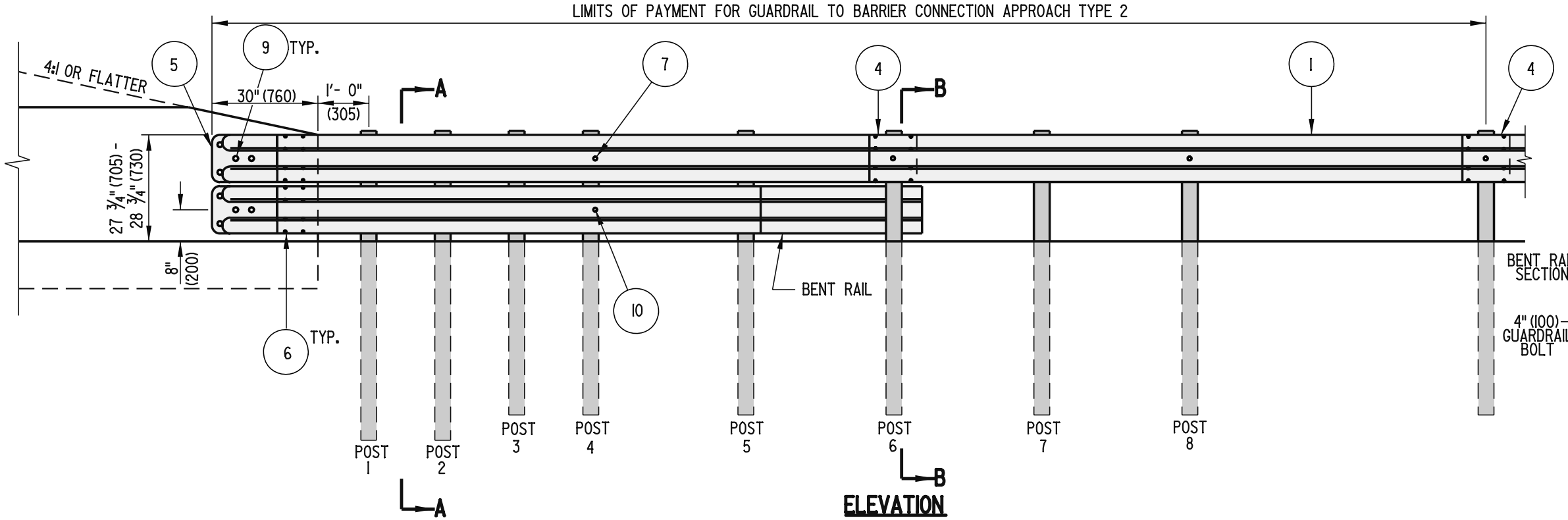
SCALE : N.T.S.



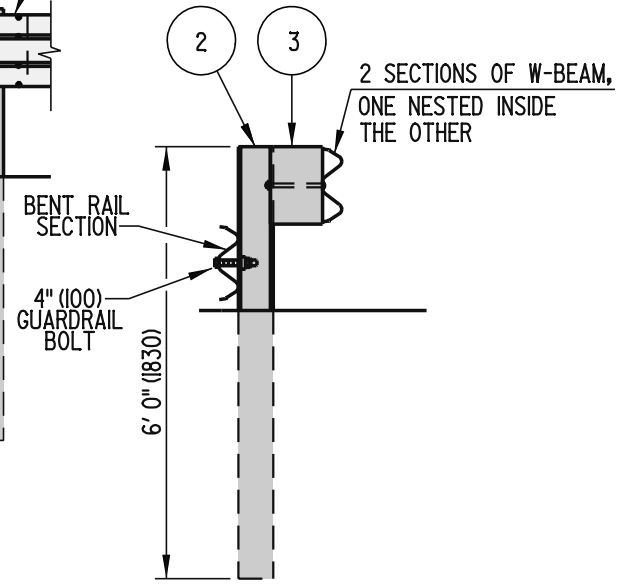

## PLAN




## SECTION A-A




## ELEVATION




## SECTION B-B

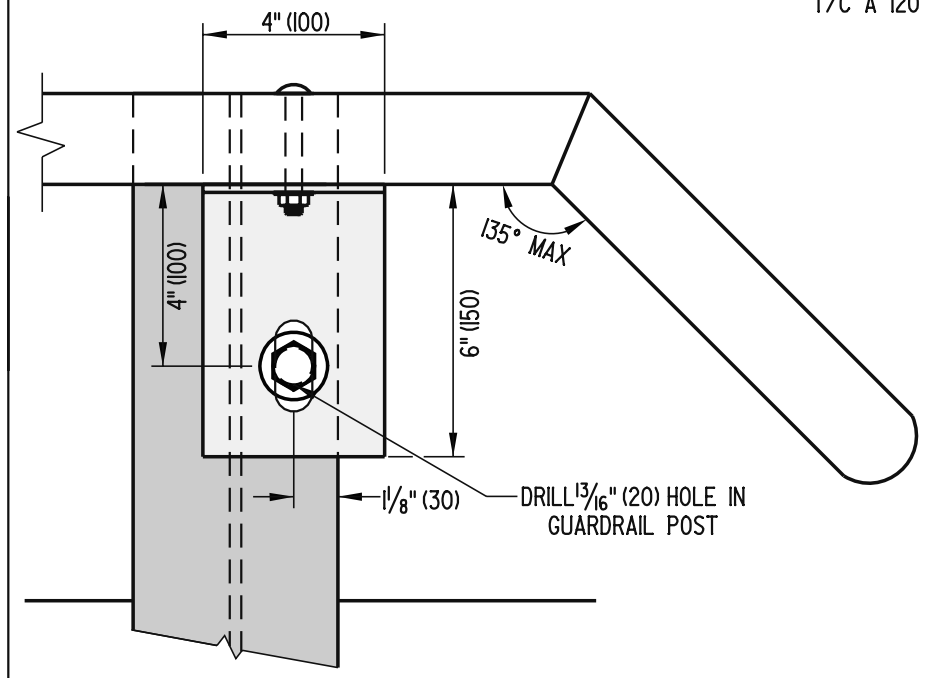
NOTES :

1). CURB SHALL NOT BE USED AT THE FACE OF RAIL WITHIN THE LIMITS OF THIS INSTALLATION.
2). POSTS 1, 2, 3, 4, AND 6 REQUIRE AN ADDITIONAL HOLE TO ATTACH WOOD BLOCKS AND/OR BENT RAIL.
3). DO NOT ATTACH RAILS TO POSTS 1, 2, 3, 5, OR 7.
4). POSTS 1 AND 2 ARE W8x13 (W200x19.3). ALL OTHER POSTS IN TRANSITION ARE W6x9 (w150x13.5).
5). ALL HOLES SHALL BE DRILLED PRIOR TO GALVANIZING.
6). BENT RAIL MAY BE SHOP BENT TO FACILITATE INSTALLATION OR MAY BE FIELD BENT USING HEAT.
7). APPROVED CONCRETE INSERTS MAY BE USED IN NEW CONSTRUCTION TO ATTACH TERMINAL CONNECTORS TO PARAPET.
8). PLACE GUARDRAIL REFLECTOR EVERY FIFTH POST.
9). FOR INSTALLATIONS WHERE CURB EXISTS, IF THE EXISTING CURB IS 8" (200) OR HIGHER AND CANNOT BE REMOVED, THE BOTTOM RAIL CAN BE ELIMINATED.

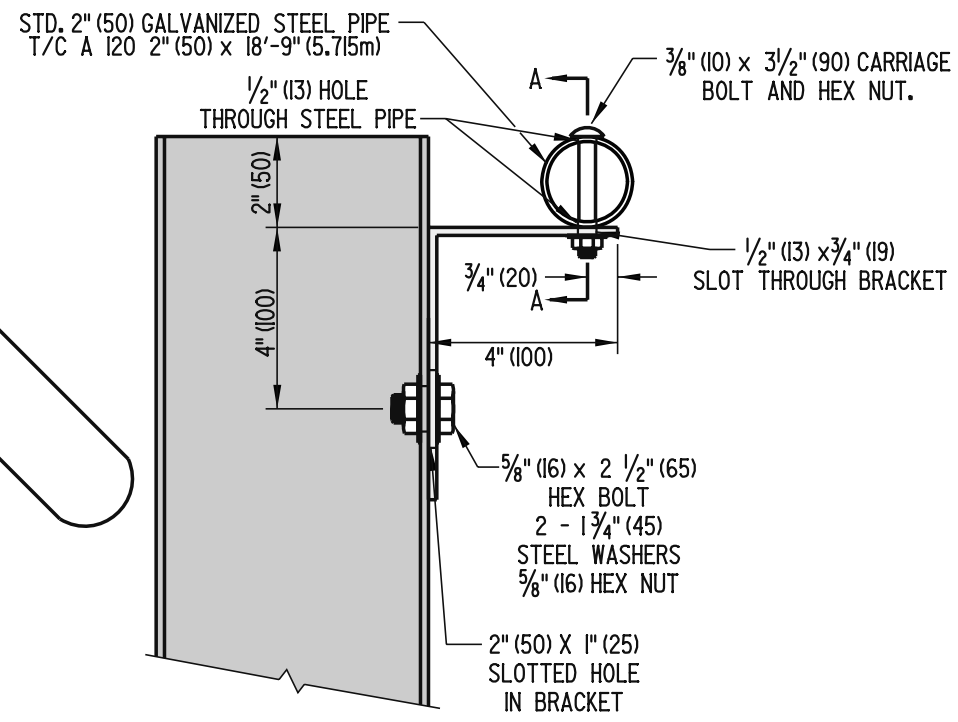
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | GUARDRAIL TO BARRER CONNECTION, APPROACH TYPE 2 | | APPROVED Carolann Wicks CHIEF ENGINEER — 12/5/05 DATE |
| | STANDARD NO. B-8 (2005) | SHT. 1 OF 2 | RECOMMENDED James M. Ojdana DESIGN ENGINEER — 11/29/05 DATE |

10/17/2005

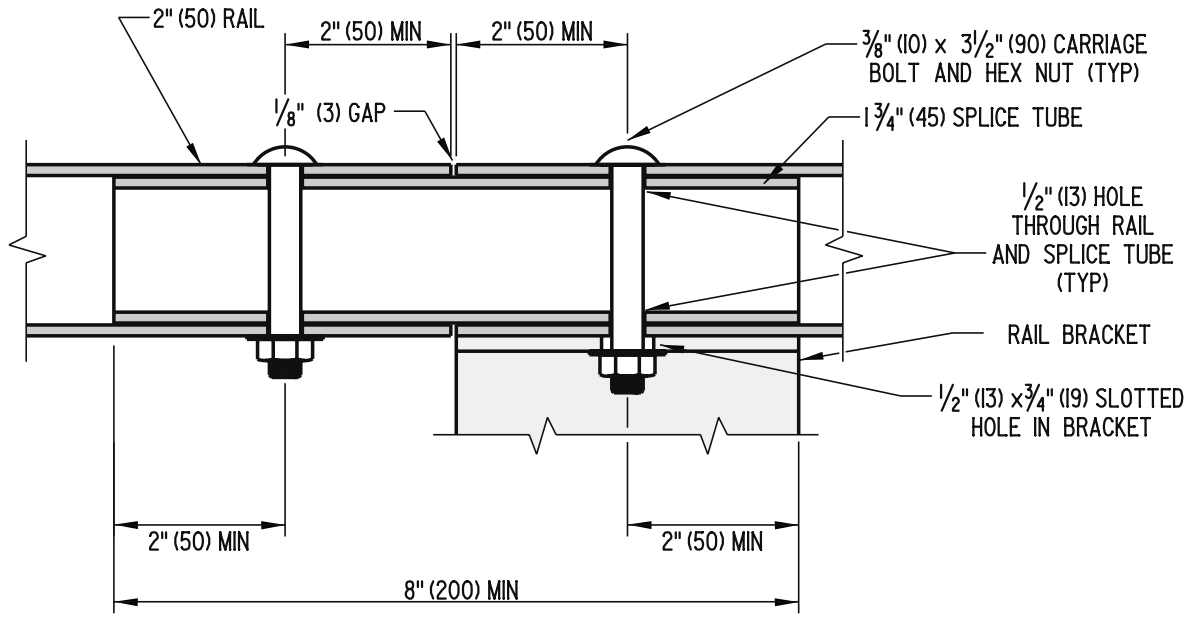
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REAR VIEW WITH START & END SECTION



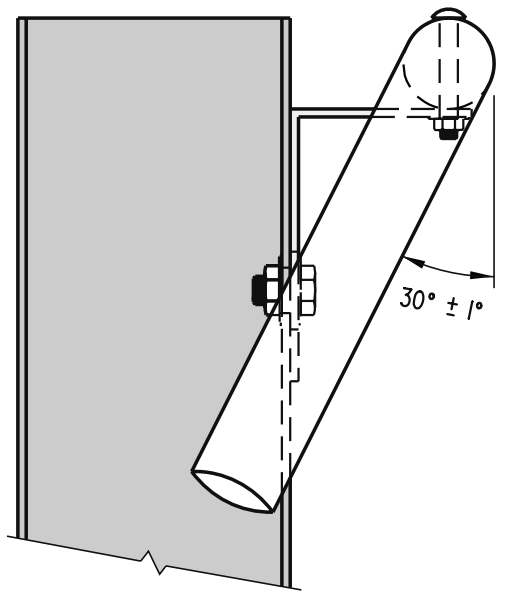

SIDE VIEW



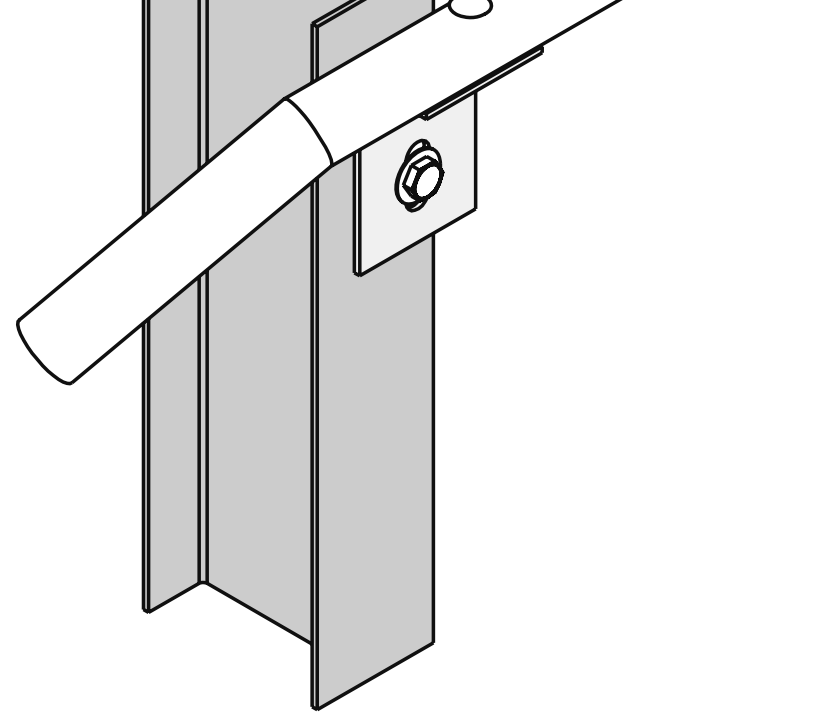

SECTION A-A AT RAIL SPLICE

NOTES:

1). RAIL SHALL BE MOUNTED ON GUARDRAIL ADJACENT TO A BIKEWAY OR SIDEWALK.
2). ALL COMPONENTS OF THE RAIL SHALL BE SHOP FABRICATED. ALL CUTTING AND DRILLING SHALL BE DONE IN THE SHOP.
3). ALL EXPOSED THREADED HARDWARE SHALL BE BURRED.
4). GUARDRAIL POSTS UPON WHICH RAIL IS TO BE INSTALLED SHALL BE SHOP DRILLED FOR THE RAIL BRACKETS DURING FABRICATION.
5). ALL RAIL SPLICES WILL BE AT RAIL SUPPORT BRACKETS, THE SAME BOLT USED TO ATTACH THE RAIL TO THE BRACKET WILL BE USED TO SECURE THE SPLICE TUBE.
6). RAILS SHALL BE INSTALLED ONLY ON STANDARD W-BEAM SECTIONS AND AT LEAST ONE POST AWAY FROM THE PAYMENT LIMITS OF THE END TREATMENT.




SIDE VIEW WITH START & END SECTION

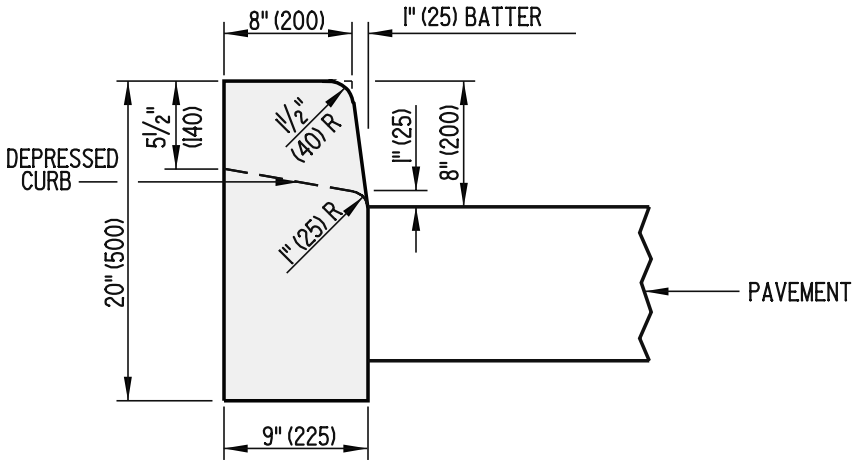


ISOMETRIC VIEW WITH START & END SECTION

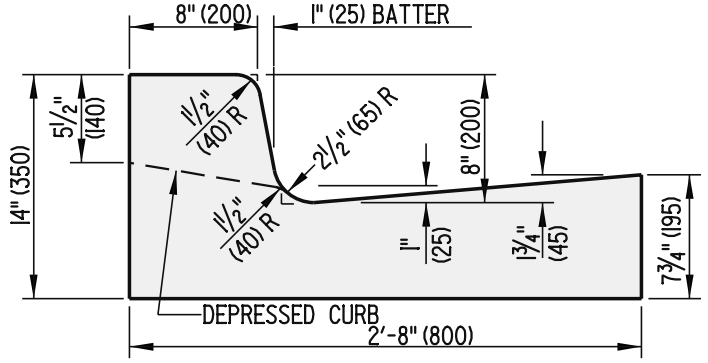
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GUARDRAIL MOUNTED RAIL | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. B-13 (2005) | SHT. 13 OF 13 | RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE |

01/19/2006

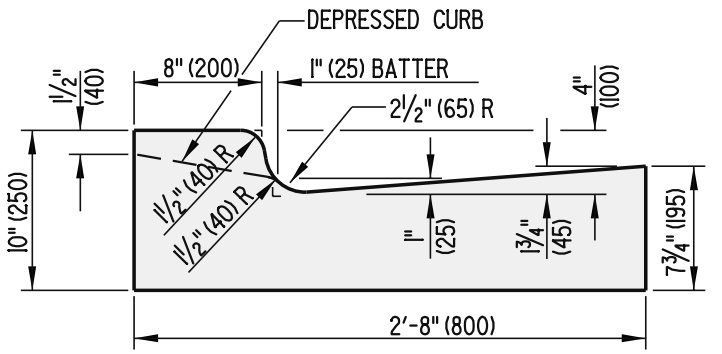
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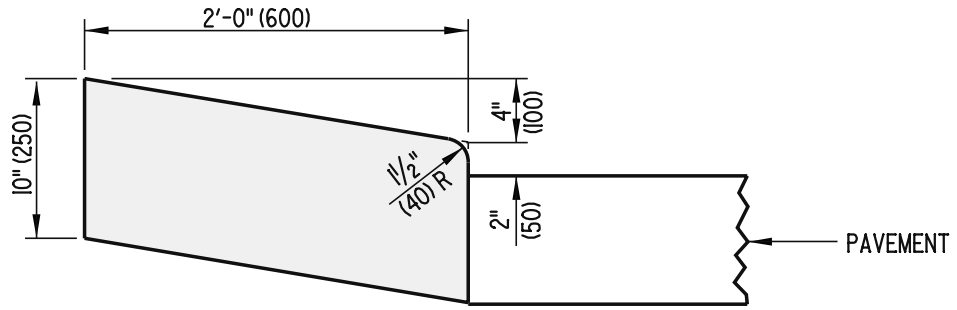

**P.C.C. CURB**
TYPE 1



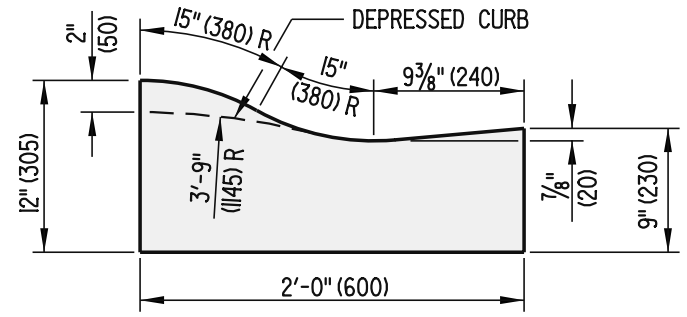

**INTEGRAL P.C.C. CURB AND GUTTER**
TYPE 1



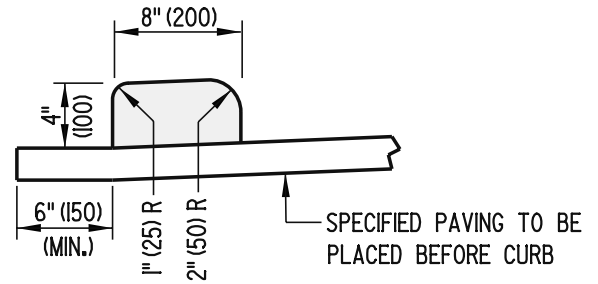

**INTEGRAL P.C.C. CURB AND GUTTER**
TYPE 4



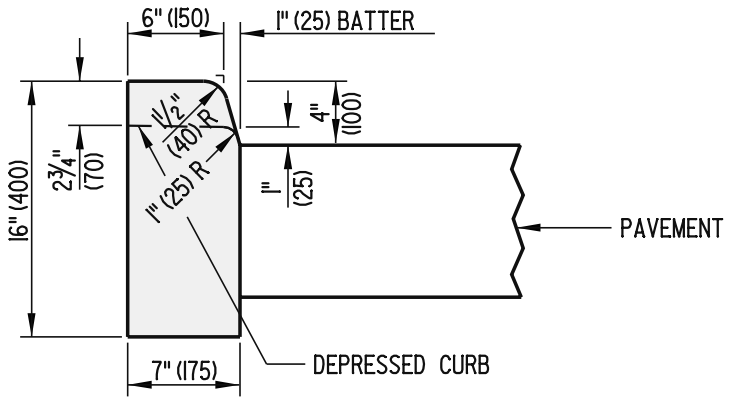

**P.C.C. CURB**
TYPE 2



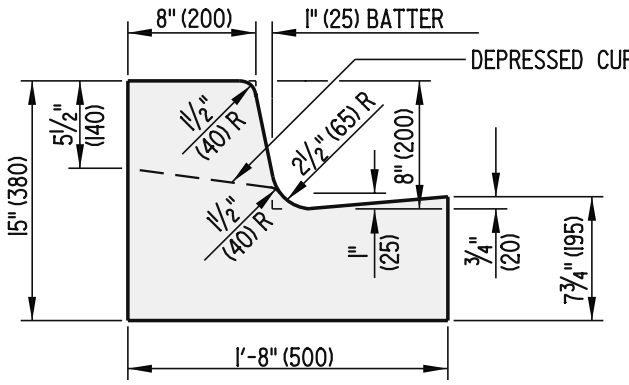

**INTEGRAL P.C.C. CURB AND GUTTER**
TYPE 2




**HOT-MIX, HOT LAID BITUMINOUS CONCRETE CURB**




**P.C.C. CURB**
TYPE 3



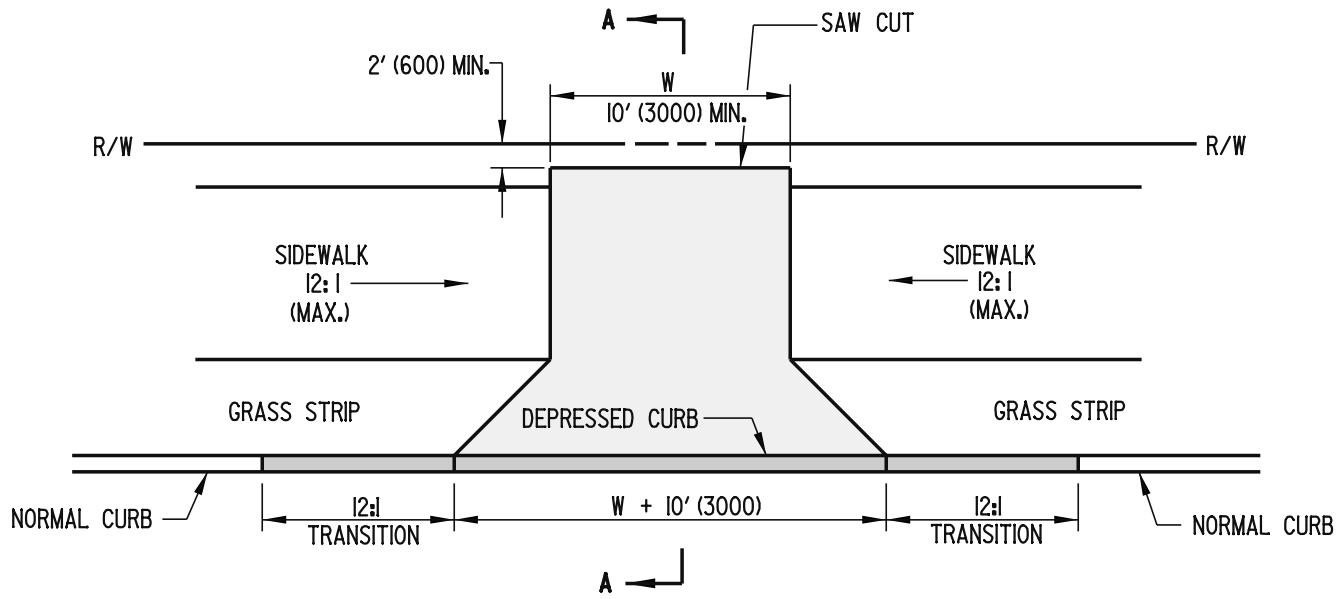

**INTEGRAL P.C.C. CURB AND GUTTER**
TYPE 3

NOTES:
1. WHEN P.C.C. CURB OR INTEGRAL P.C.C. CURB AND GUTTER IS PLACED ADJACENT TO PORTLAND CEMENT CONCRETE PAVEMENT, CONSTRUCT THE JOINT AS PER THE LONGITUDINAL JOINT SEALANT DETAIL ON STANDARD P-2, SHEET 3 OF 5. USE APPROVED JOINT FILLER TO SEAL. WORK TO BE PAID UNDER RESPECTIVE CURB AND GUTTER ITEM.
2. DEPRESS CURB AT ENTRANCES AS DETAILED ON THIS SHEET.
3. DEPRESS CURB FLUSH WITH PAVEMENT AT CURB RAMPS. MAXIMUM SLOPE OF CURB AT CURB RAMPS IS 20:1 IN THE DIRECTION OF PEDESTRIAN TRAVEL. SEE STANDARD NO C-2, 1 OF 4.

| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | P.C.C. CURB, P.C.C. CURB & GUTTER, AND HOT-MIX CURB | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. C-1 (2005) SHT. 1 OF 1 | RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE |

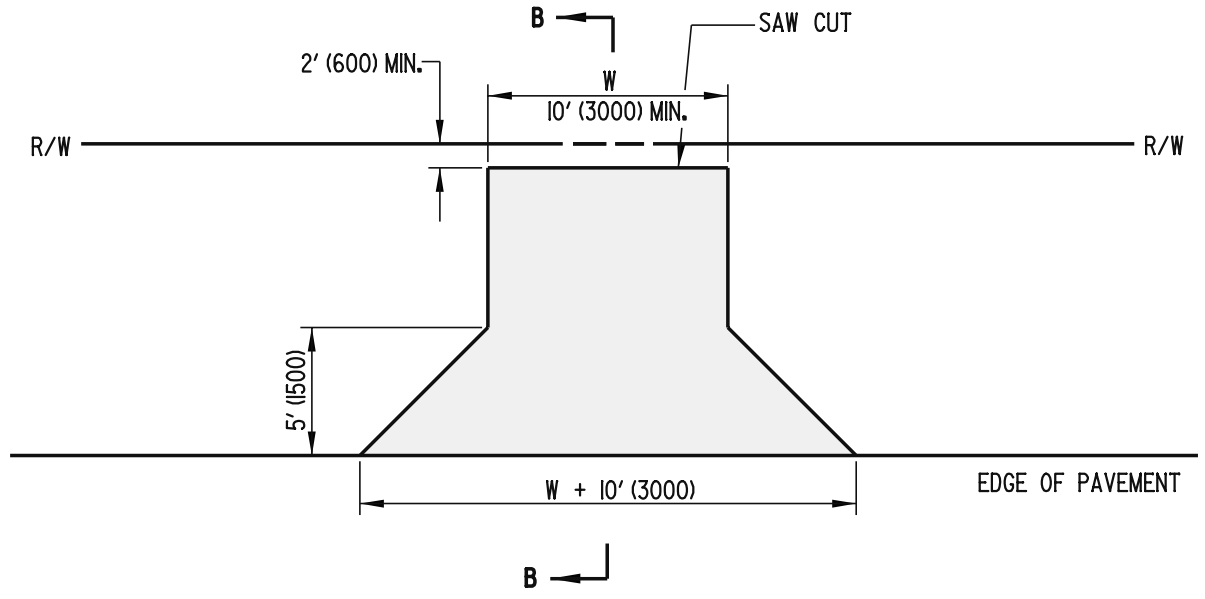
01/19/2006

SCALE : N.T.S.



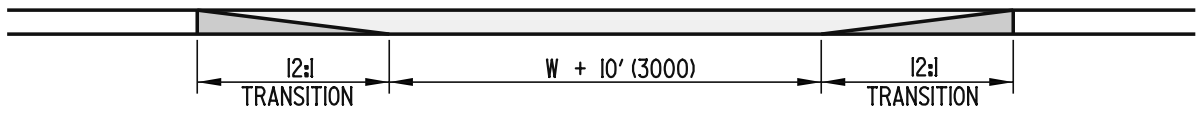

**PLAN**

**ENTRANCE WITH SIDEWALK**

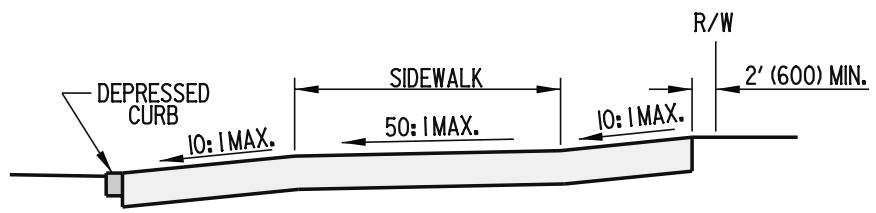



**PLAN**

**ENTRANCE WITHOUT SIDEWALK**




**ELEVATION**




**SECTION A-A**

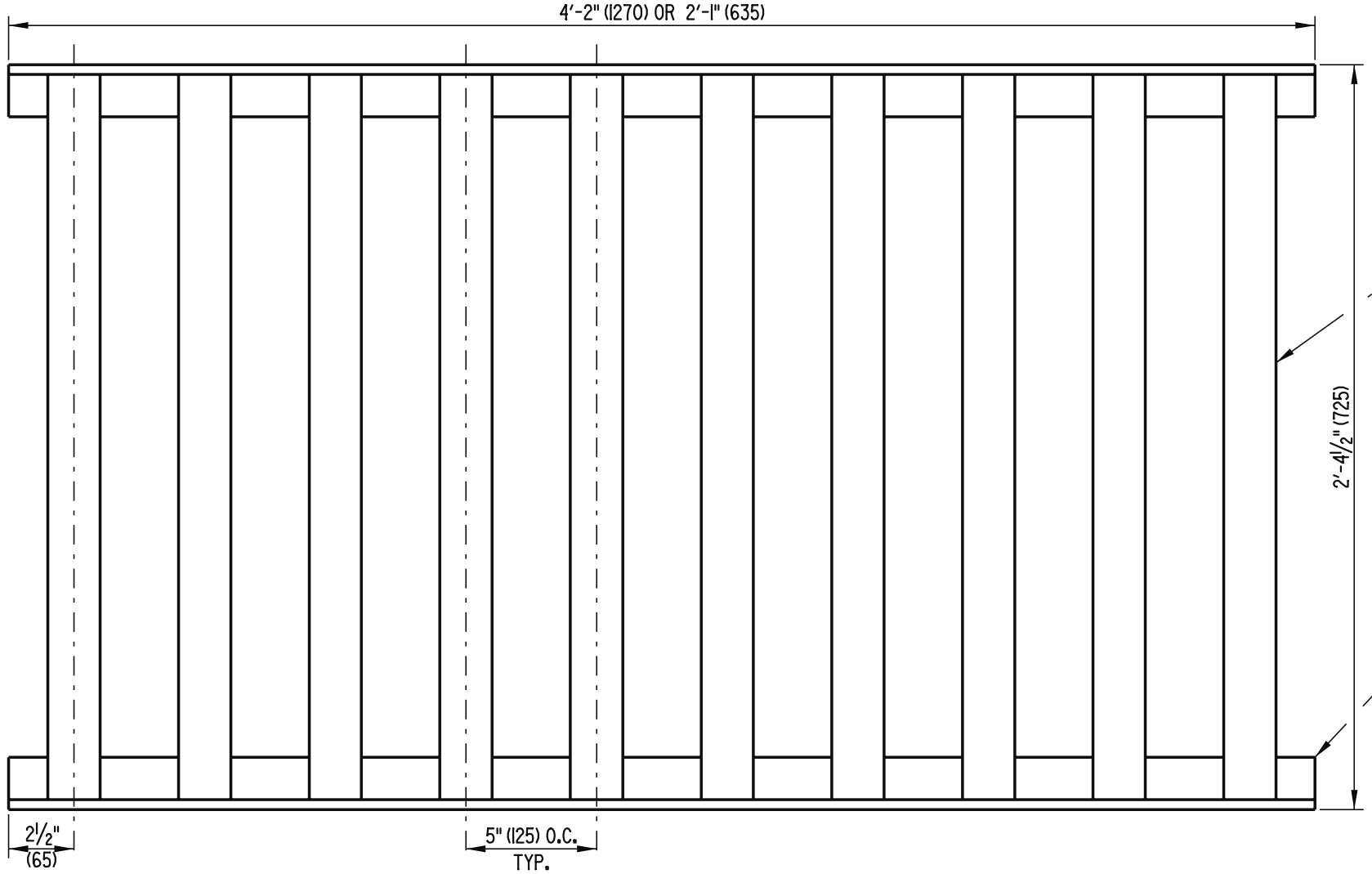



**SECTION B-B**

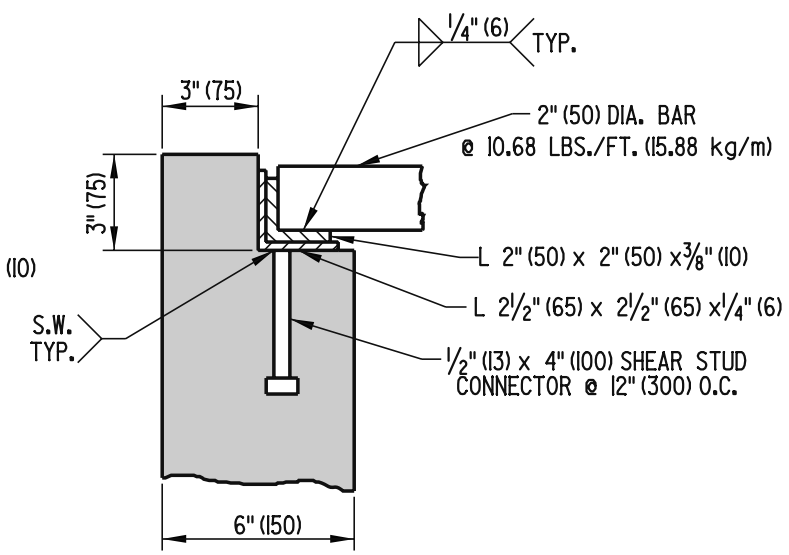
| | | | |
|---|---|---|---|
| DELAWARE<br>DEPARTMENT OF TRANSPORTATION | ENTRANCES | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. C-3 (2005) | SHT. 1 OF 1 | RECOMMENDED James M. Ottaviano DESIGN ENGINEER 11/29/05 DATE |

10/17/2005

SCALE : N.T.S.




**GRATE DETAIL**

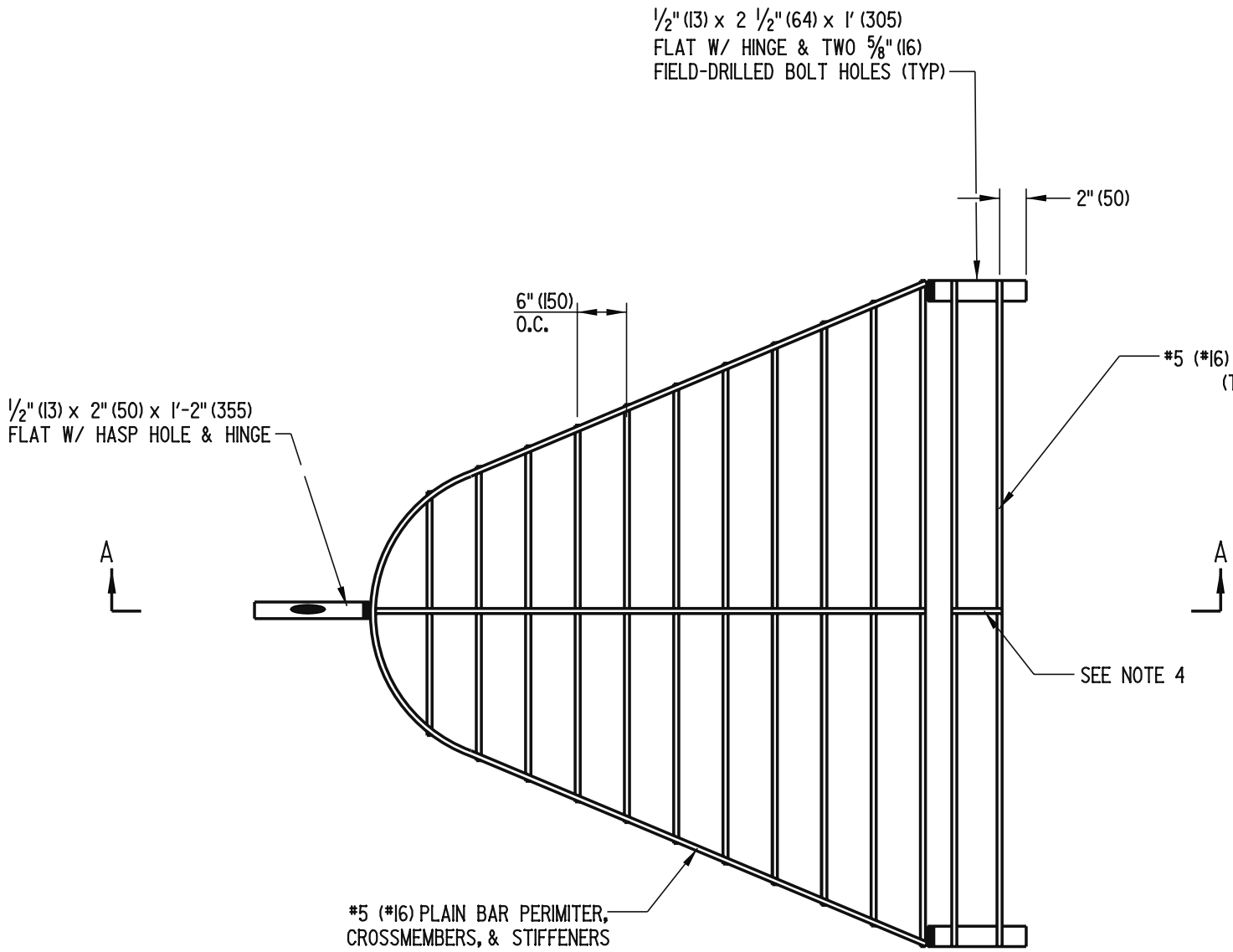



**FRAME & GRATE ASSEMBLY DETAIL**

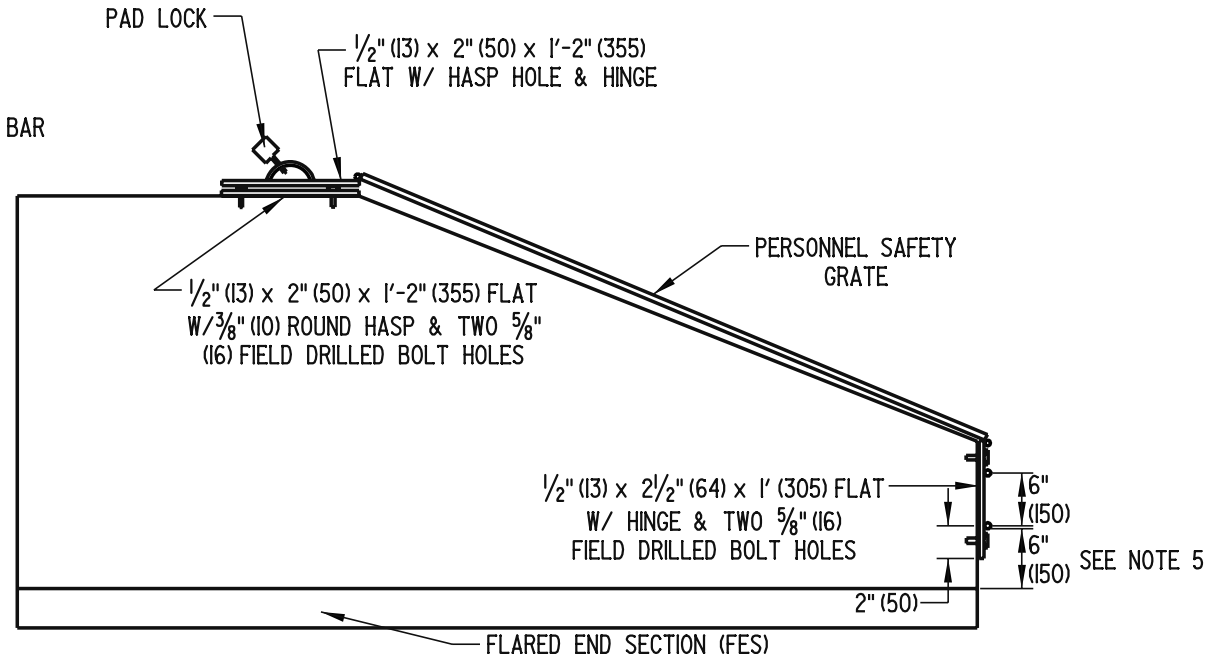
| DELAWARE DEPARTMENT OF TRANSPORTATION | SAFETY GRATES | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. D-3 (2005) | SHT. 1 OF 2 | RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE |

11/23/2005

SCALE : N.T.S.




PLAN VIEW



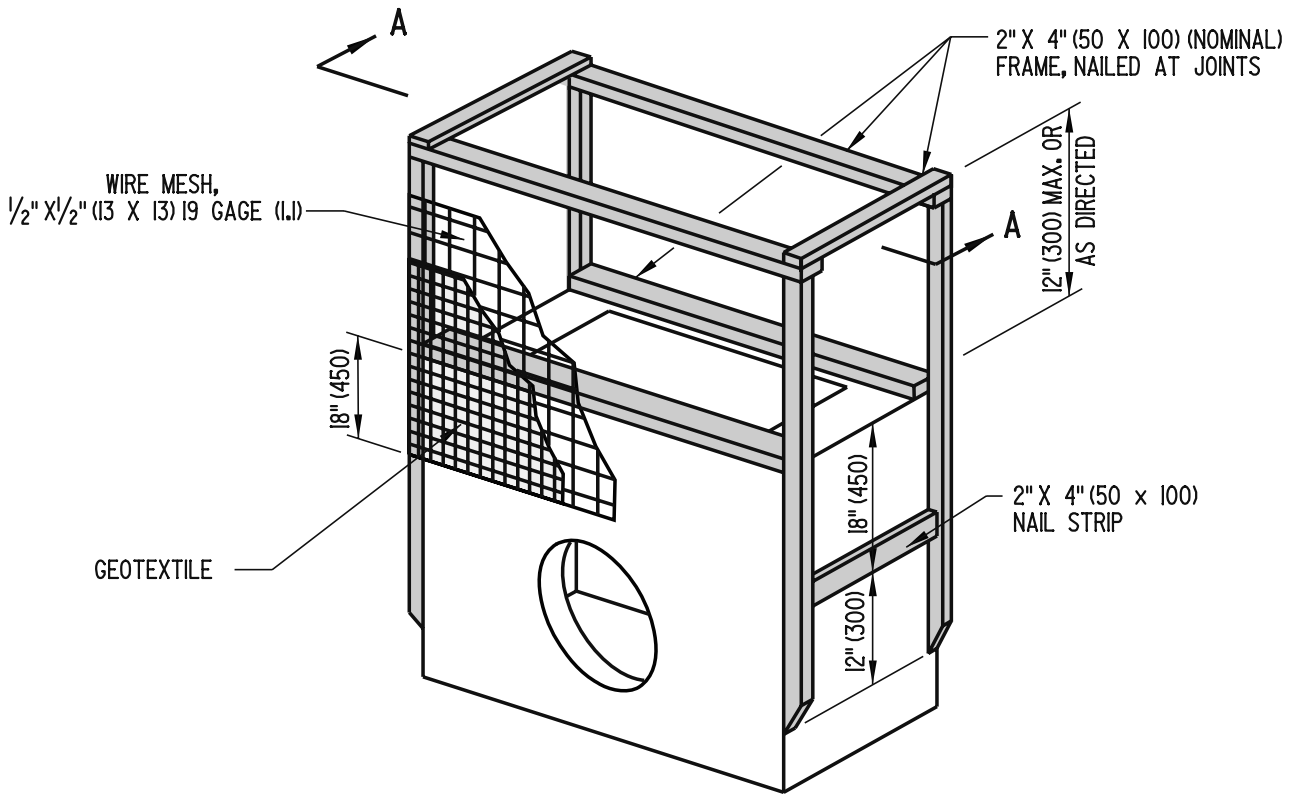

SECTION A-A

NOTES:
1). PERSONNEL SAFETY GRATES (PSG) SHALL ONLY BE INSTALLED ON STORM WATER PIPE INLETS.
2). THE GRATE SHALL BE MADE TO FIT THE OUTSIDE PERIMETER OF THE FLARED END SECTION (FES) ± 1/2" (13).
3). ALL BOLT HOLES ARE TO BE DRILLED IN THE FIELD.
4). A STIFFENER IS TO BE INSTALLED WHERE TWO OR MORE BARS ARE USED.
5). BOTTOM BAR SHALL BE 6" (150) ABOVE INVERT OF FES.

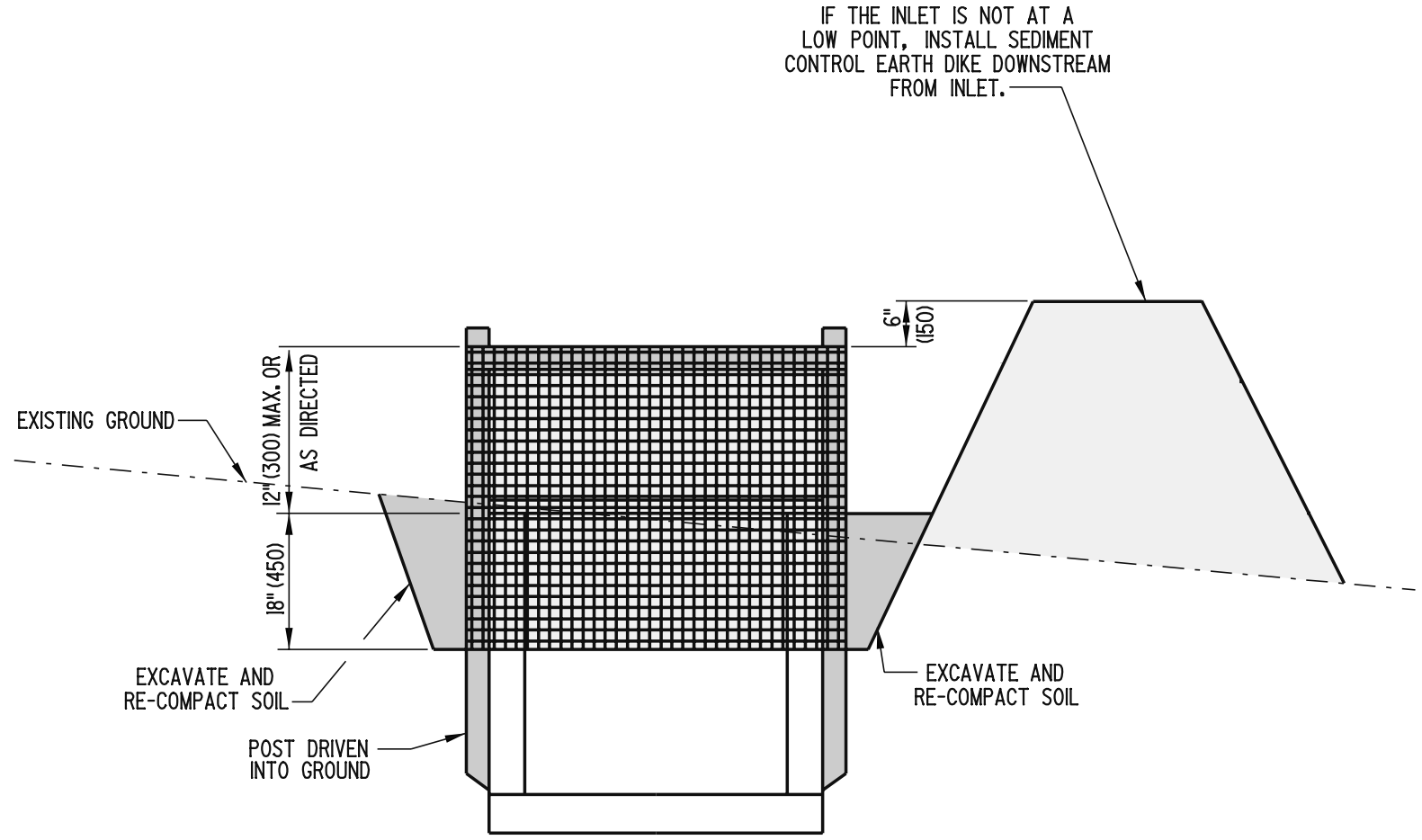
| DELAWARE DEPARTMENT OF TRANSPORTATION | SAFETY GRATES | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. D-3 (2005) | SHT. 2 OF 2 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

01/19/2006

SCALE : N.T.S.




ISOMETRIC VIEW

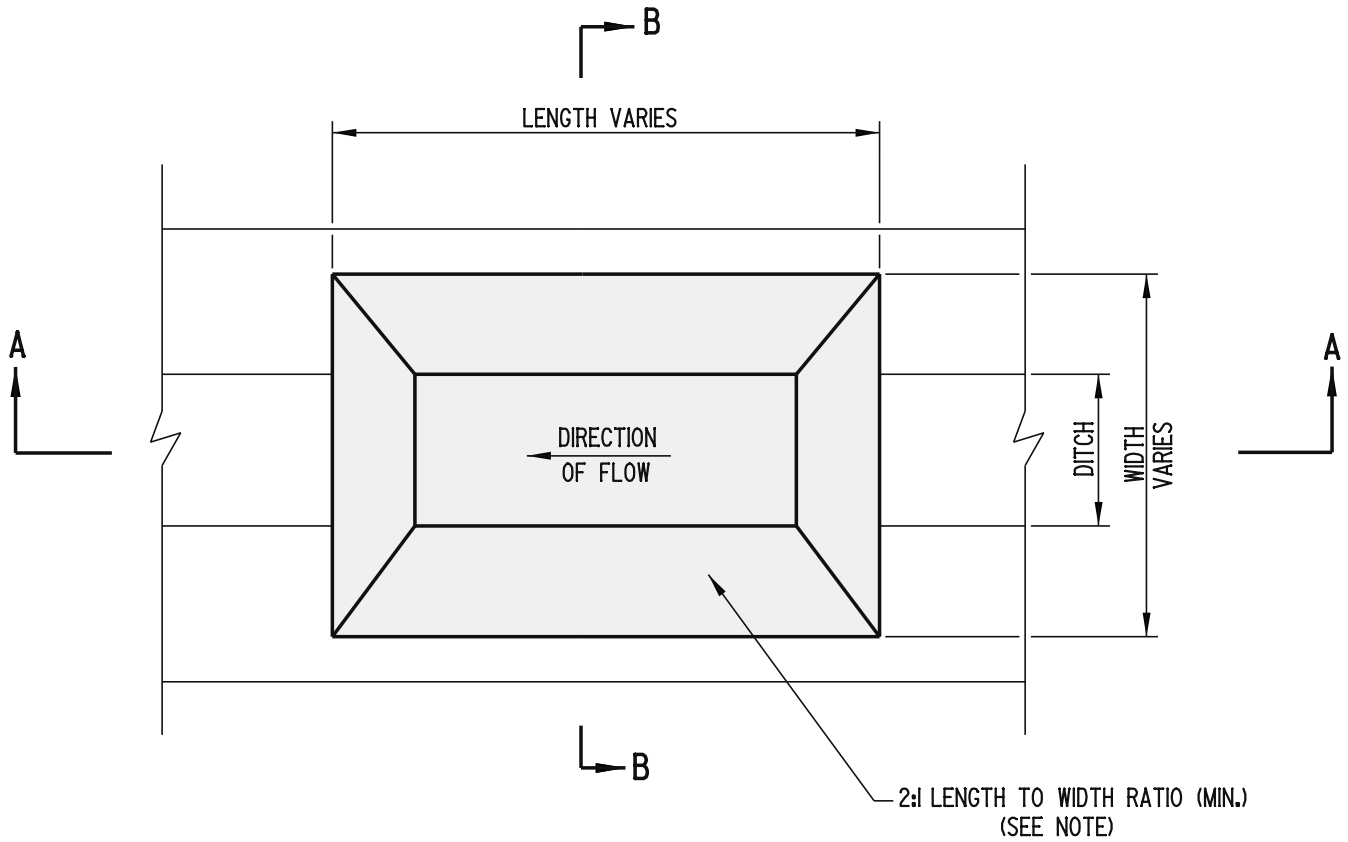



SECTION A-A

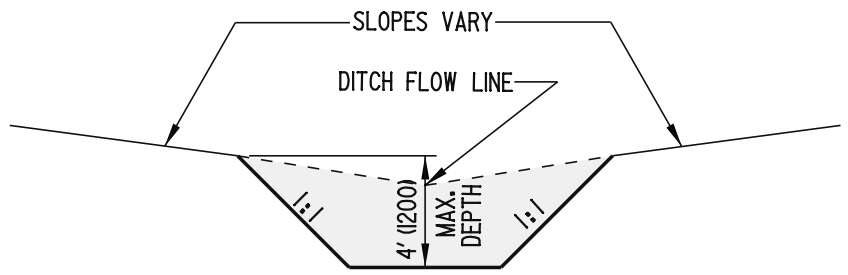
| | | | |
|---|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | DRAINAGE INLET SEDIMENT CONTROL | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. E-3 (2005) | SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

01/19/2006

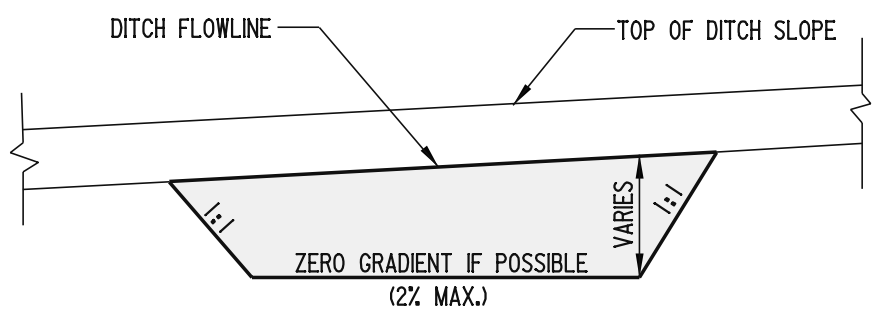
SCALE : N.T.S.




**PLAN**




**SECTION B-B**




**SECTION A-A**

**NOTES:** 1). SEDIMENT TRAPS ARE INTENDED FOR USE IN EXISTING, PROPOSED, AND TEMPORARY DITCHES OF ALL TYPES WITH A MAXIMUM DRAINAGE AREA OF 15 ACRES (6 HECTARES), AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

2). SIDE SLOPES SHALL BE STABILIZED WITH "TEMPORARY GRASS SEEDING, DRY GROUND" AND STRAW MULCH.

3). AN OUTLET STRUCTURE IS REQUIRED. STONE CHECK DAMS, PERFORATED RISER PIPES, SKIMMER DEWATERING DEVICES, OR DRAINAGE INLETS MAY BE USED. SEE APPROPRIATE STANDARD SHEET FOR ADDITIONAL INFORMATION.

4). FOR SIZE, LOCATION, ETC. OF SEDIMENT TRAP, SEE CONSTRUCTION PHASING, M.O.T., AND EROSION CONTROL PLANS.

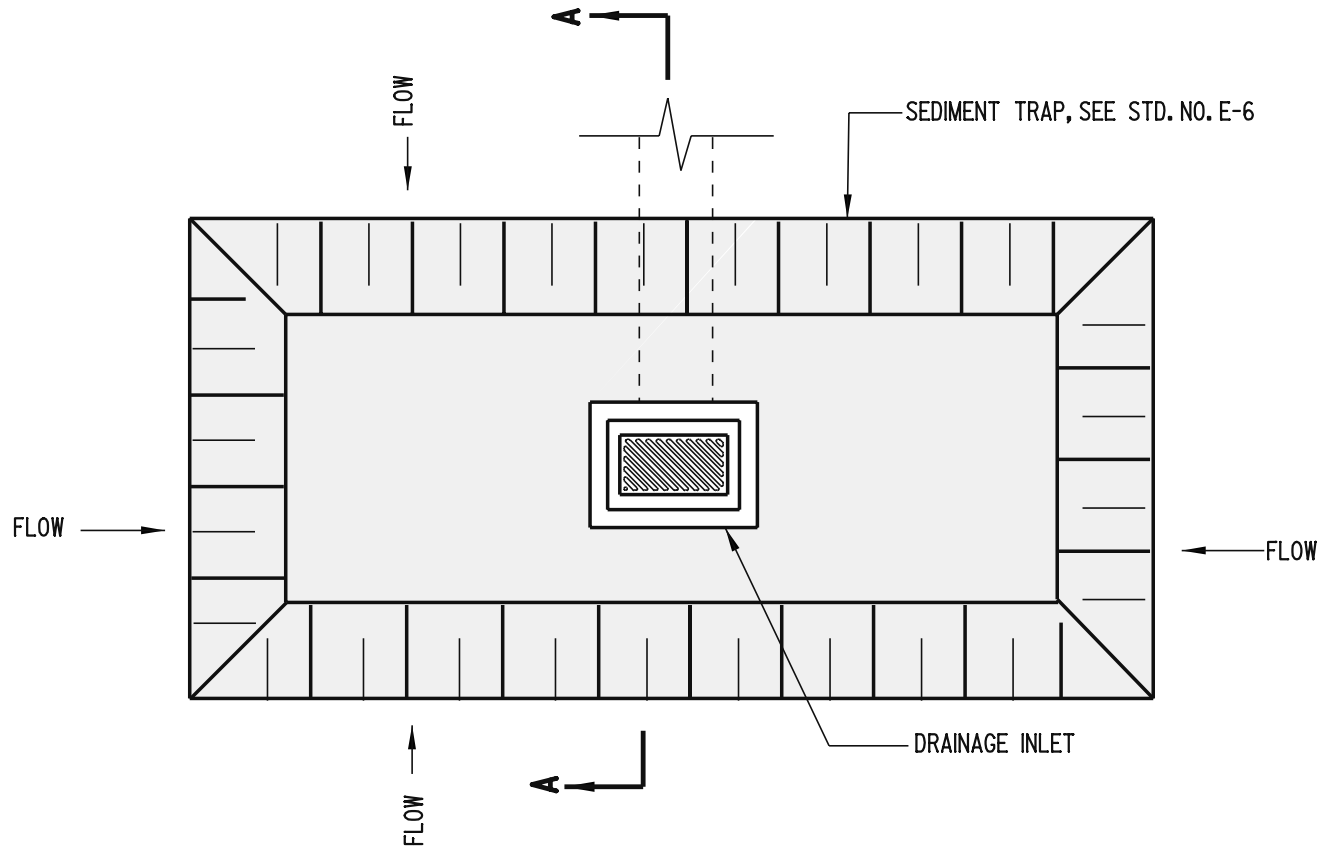
5). ALL FILL SLOPES SHALL BE 2:1.

6). A 2:1 LENGTH TO WIDTH RATIO SHOULD BE ACHIEVED WHERE POSSIBLE. IF THIS IS NOT POSSIBLE, THE USE OF BAFFLES OR OTHER SPECIAL DESIGNS SHOULD BE INCORPORATED TO INCREASE FLOW TIME.

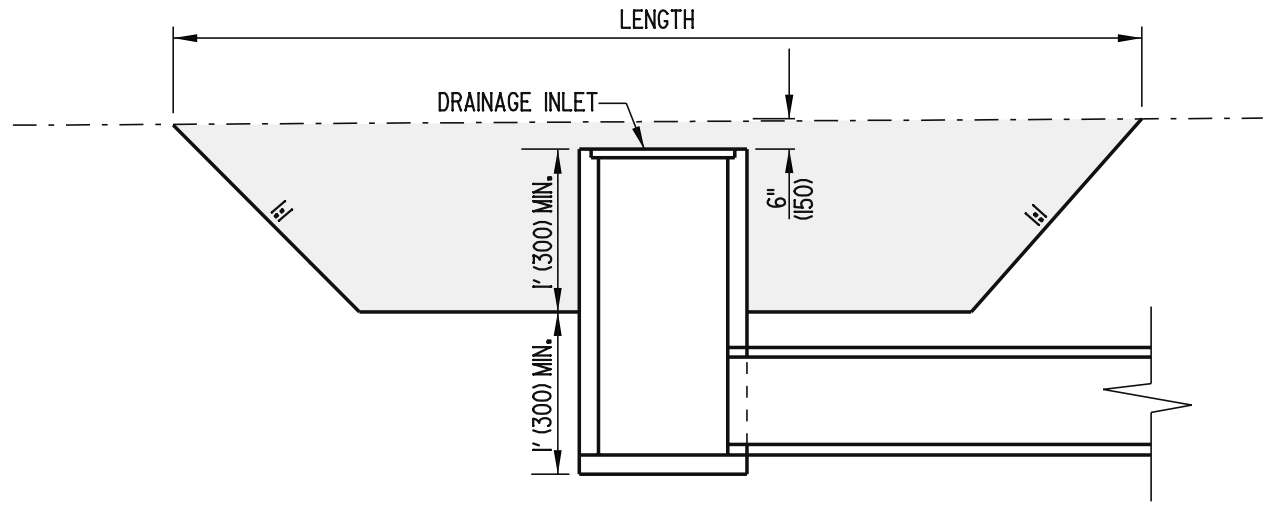
| DELAWARE DEPARTMENT OF TRANSPORTATION | SEDIMENT TRAP | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. E-6 (2005) | SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

08/19/2005

SCALE : N.T.S.




PLAN




SECTION A-A

**NOTES:** 1). THE WORK SHALL CONSIST OF THE CONSTRUCTION OF A SEDIMENT TRAP AROUND A DRAINAGE INLET TO ALLOW SEDIMENTATION TO OCCUR BEFORE RUNOFF ENTERS THE DRAINAGE INLET.

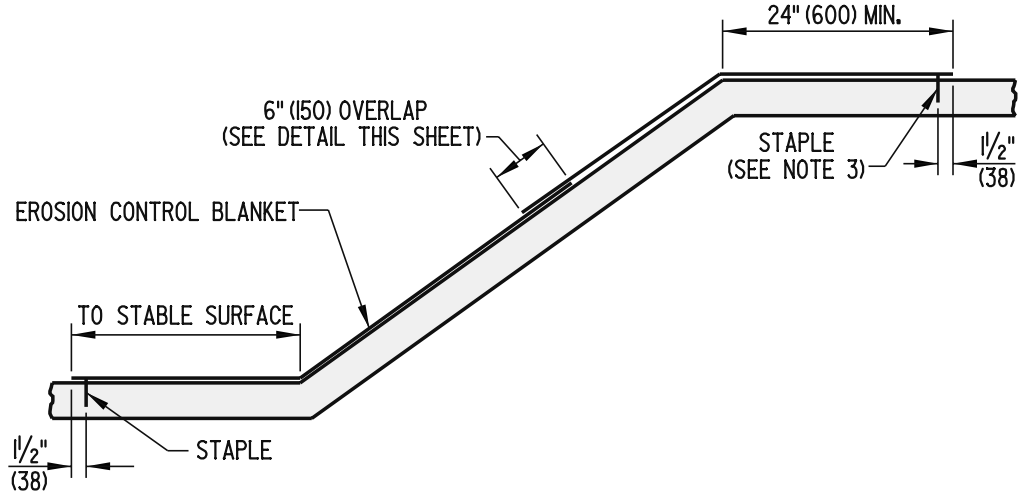
2). DRAINAGE INLET SEDIMENT TRAPS SHALL BE LIMITED TO A THREE (3) ACRE (1.2 HECTRARE) MAXIMUM DRAINAGE AREA.

3). THE DIMENSIONS OF THE DRAINAGE INLET SEDIMENT TRAP ARE TO BE AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

| DELAWARE DEPARTMENT OF TRANSPORTATION | SEDIMENT TRAP, USING DRAINAGE INLET AS OUTLET | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. E-7 (2005) | SHT. 1 OF 1 | RECOMMENDED James M. Oiffer DESIGN ENGINEER 11/29/05 DATE |

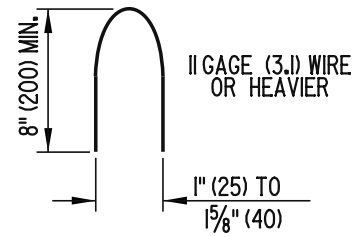
01/19/2006

SCALE : N.T.S.

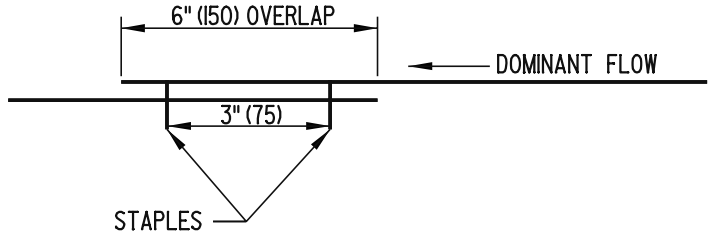



## STABILIZATION OF EMBANKMENTS

**NOTES:**
1. STAPLES TO BE STAGGERED AT 18" (450) SPACING.
2. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.
3. WHEN OFFSITE RUNOFF OCCURS, ADDITIONAL MEASURES AS DIRECTED BY THE ENGINEER SHALL BE USED TO ENSURE STABILITY OF EMBANKEMENT.

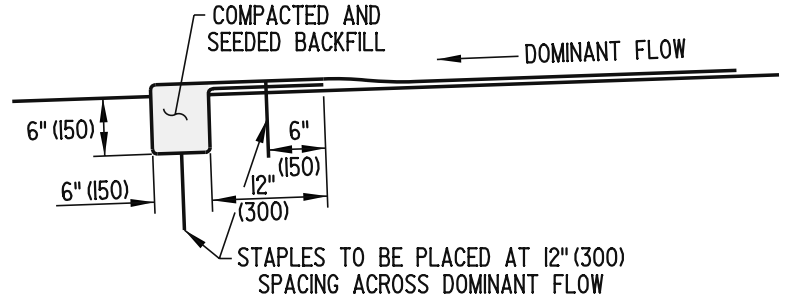



## STAPLE DETAIL



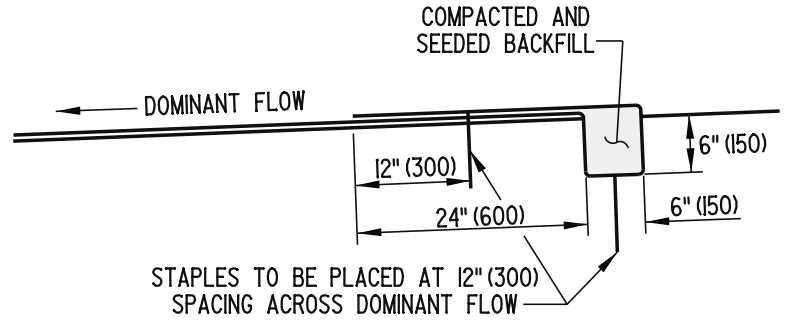

## OVERLAP DETAIL

STAPLES TO BE STAGGERED AT 6" (150) SPACING.



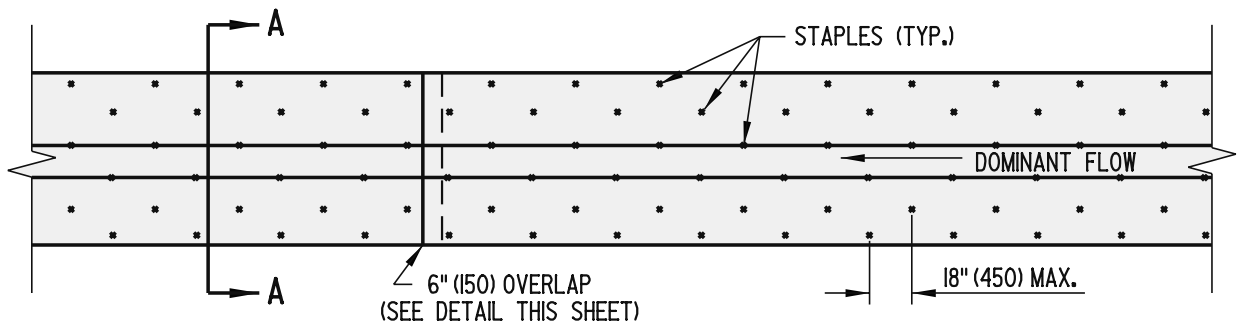

## INITIAL TRENCH ANCHOR DETAIL

APPLIED AT THE DOWNSTREAM END OF DITCH



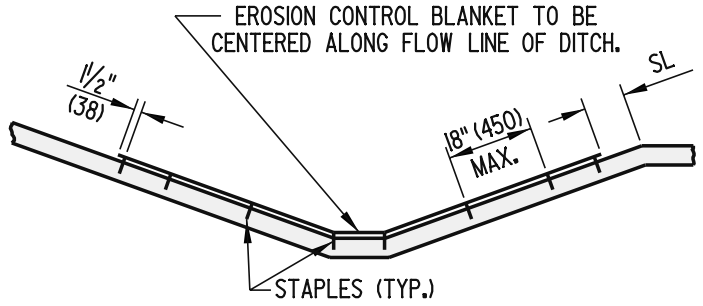

## TERMINAL TRENCH ANCHOR DETAIL

APPLIED AT THE UPSTREAM END OF DITCH




## STABILIZATION OF DITCHES PLAN

**NOTES:**
1. ADDITIONAL STAPLES NOT SHOWN ARE REQUIRED AT OVERLAPS. SEE OVERLAP DETAIL FOR STAPLE PLACEMENT.
2. STAPLES ARE TO BE STAGGERED.
3. TOPSOIL UNDER EROSION CONTROL BLANKET IS TO BE TRACKED AND SEEDED.



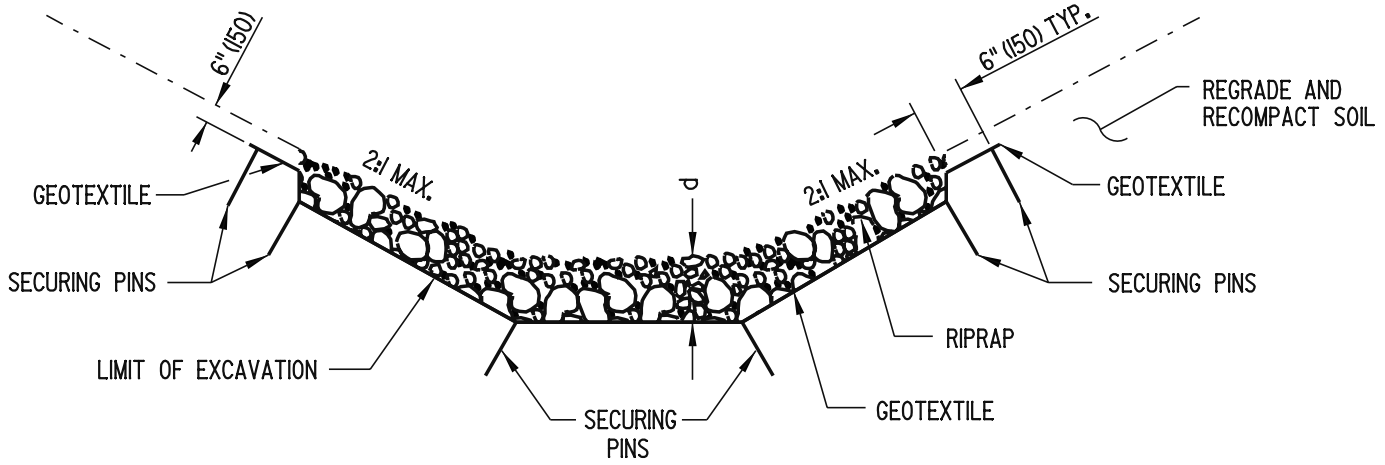

## STABILIZATION OF DITCHES SECTION A-A

STAPLES ALONG LONGITUDINAL EDGES SHALL BE SPACED AS FOLLOWS:
18" (450) WHEN SL ≤ 20' (6000)
9" (225) WHEN SL > 20' (6000)

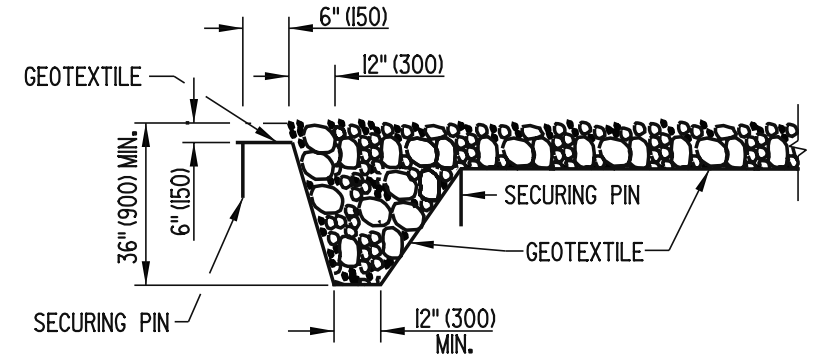
| DELAWARE DEPARTMENT OF TRANSPORTATION | EROSION CONTROL BLANKET APPLICATIONS | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. E-9 (2005) | SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

08/30/2005

SCALE : N.T.S.



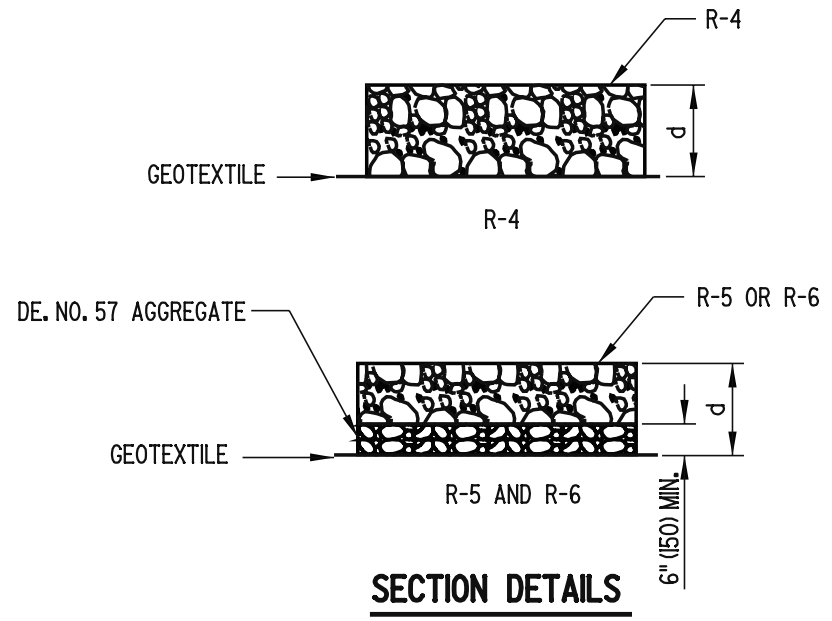

## SECTION A-A




## SECTION B-B




## PLAN




## SECTION DETAILS

**CLASS RIPRAP**

R-4 d = 14" (350) MIN.

R-5 d = 26" (650) MIN.

R-6 d = 34" (850) MIN.

**NOTES:**

1). SECURING PINS ARE TO BE PLACED AT LOCATIONS SHOWN AND AT 24" (600) LONGITUDINAL AND LATERAL SPACING.

2). SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.

3). USE OF R-7 RIPRAP WILL REQUIRE A SEPARATE PROFESSIONAL ENGINEERING DESIGN FOR SIGHT SPECIFIC CONDITIONS.

DELAWARE
DEPARTMENT OF TRANSPORTATION

RIPRAP DITCH

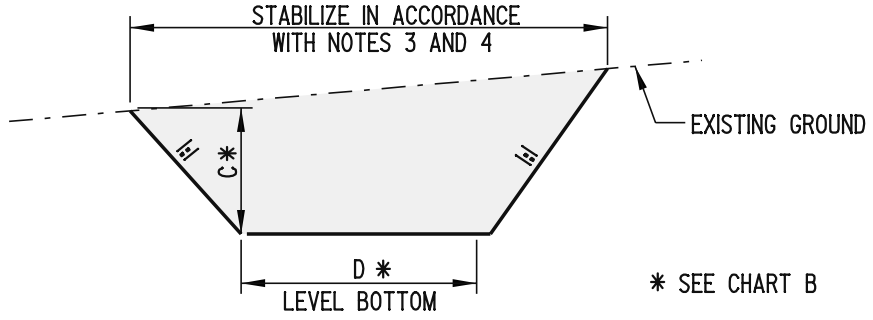
STANDARD NO. E-10 (2005) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE

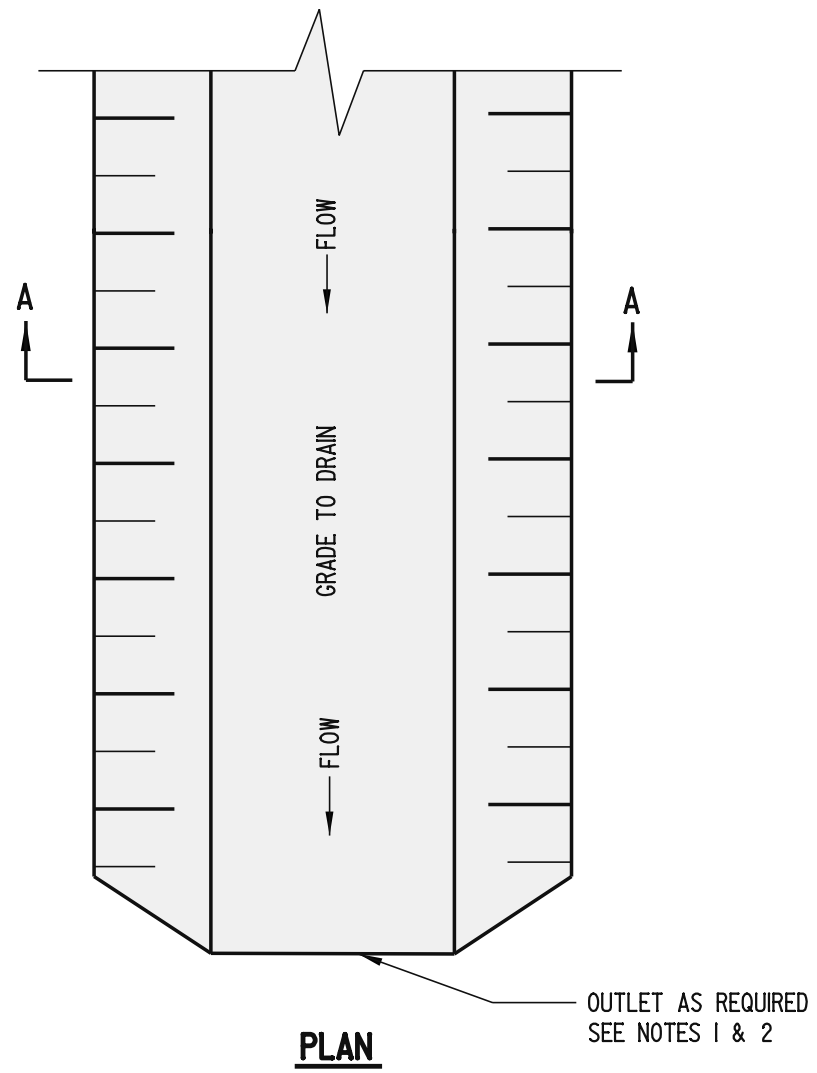
RECOMMENDED James M. Ojeda DESIGN ENGINEER 11/29/05 DATE

08/30/2005

SCALE : N.T.S.




**SECTION A-A**




**PLAN**

| CHART A - STABILIZATION | | | |
|---|---|---|---|
| SYMBOL | SWALE GRADE | TYPE OF TREATMENT | |
| | | DRAINAGE AREA A (5 AC (2 ha) OR LESS) | DRAINAGE AREA B (5 AC - 10 AC (2 ha - 4 ha)) |
| 1 | 0.5-2.0% | SEED USED WITH EROSION CONTROL BLANKET | SEED USED WITH EROSION CONTROL BL. |
| 2 | 2.1-8.0% | R-4 RIRRAP | R-4 RIRRAP |
| 3 | 8.1-20% | ENGINEERED DESIGN | ENGINEERED DESIGN |

| CHART B - SWALE DIMENSIONS | | |
|---|---|---|
| SYMBOL | SWALE A | SWALE B |
| C | 1' (300) MIN. | 1' (300) MIN. |
| D | 4' (1200) MIN. | 6' (1800) MIN. |

SEE SECTION A - A

**NOTES:**

1). DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.

2). DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET DIRECTLY INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.

3). IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.

4). IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".

DELAWARE
DEPARTMENT OF TRANSPORTATION

**TEMPORARY SWALE**

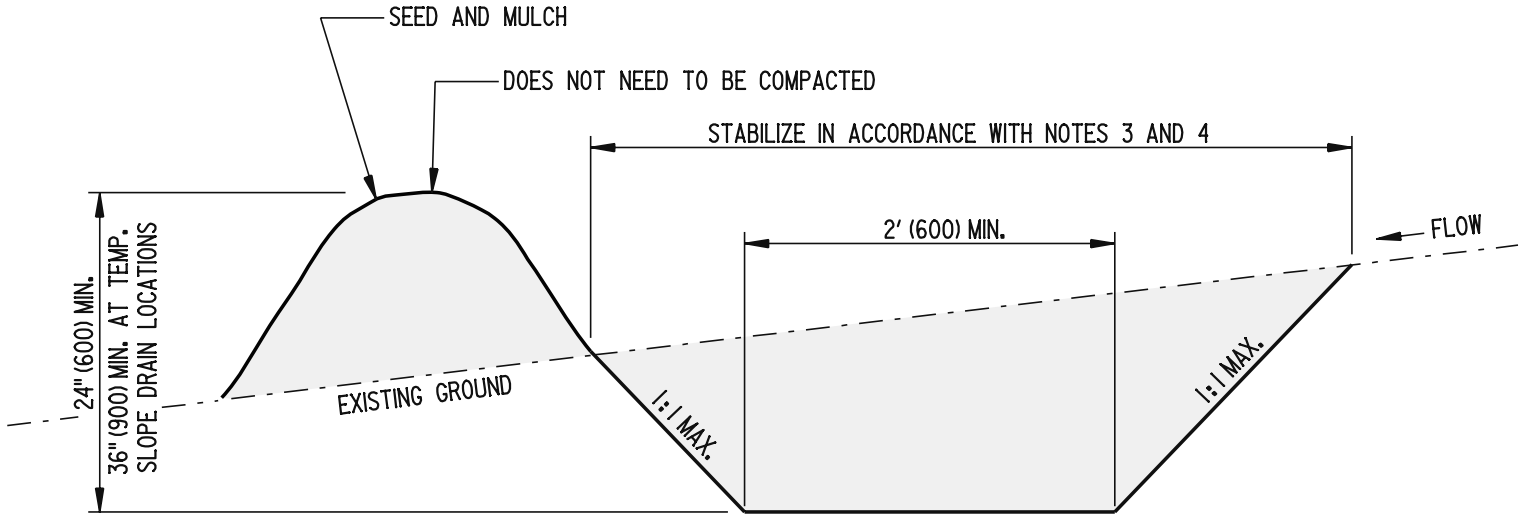
STANDARD NO. E-11 (2005) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE

RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE

08/30/2005

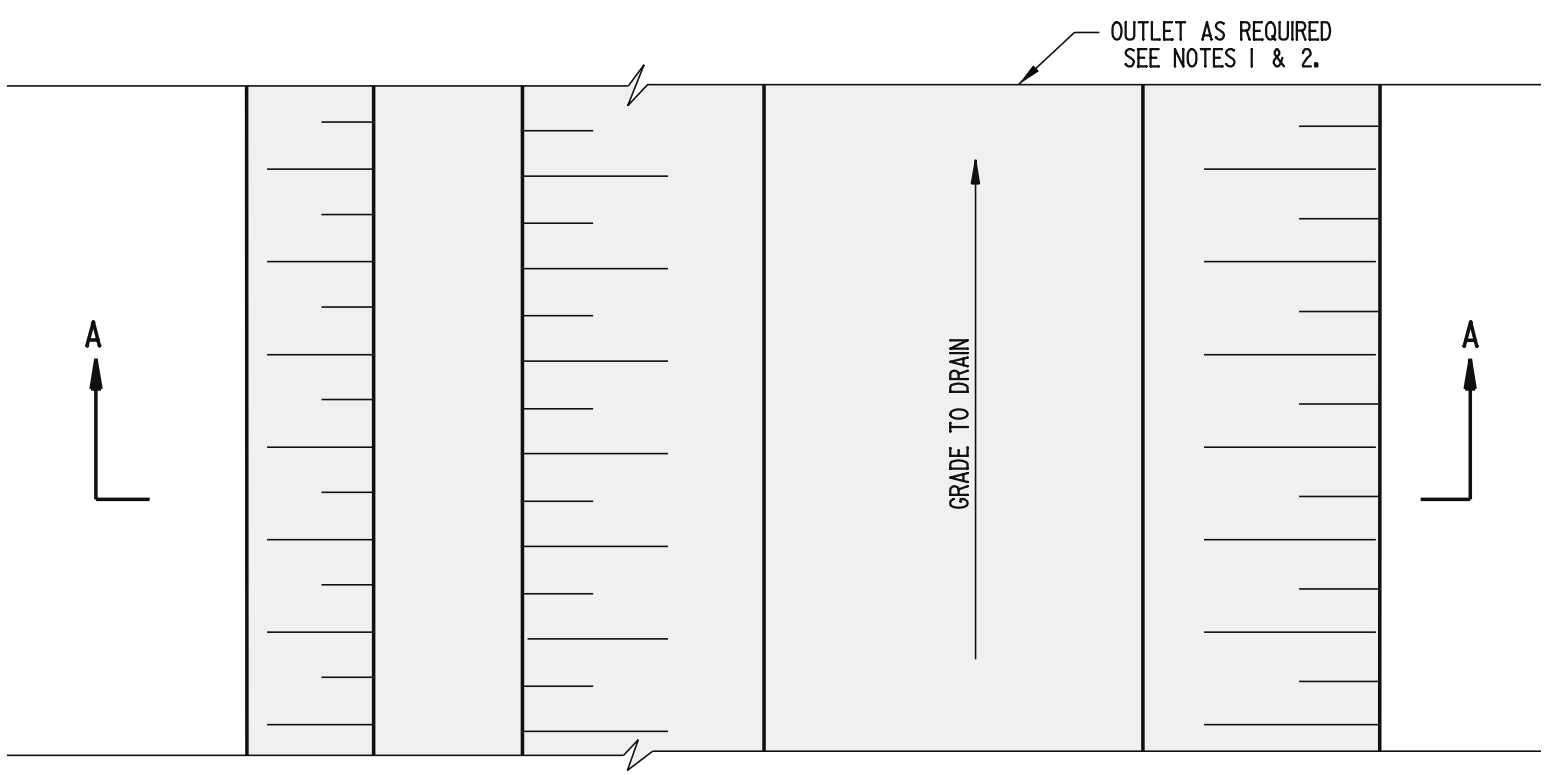
SCALE : N.T.S.




**SECTION A-A**

| CHART A - SWALE STABILIZATION | | |
|---|---|---|
| SYMBOL | SWALE GRADE | TYPE OF TREATMENT |
| A-1 | 0.5-2.0% | SEED AND EROSION CONTROL BLANKET |
| A-2 | 2.1-8.0% | LINED R-4 RIPRAP |
| A-3 | 8.1-20% | ENGINEERED DESIGN |

MAXIMUM DRAINAGE AREA: 2 ACRES (0.8 ha)




**PLAN**

**NOTES:**

1). DIVERTED RUNOFF FROM A DISTURBED AREA SHALL BE CONVEYED TO A SEDIMENT TRAPPING DEVICE.

2). DIVERTED RUNOFF FROM AN UNDISTURBED AREA SHALL OUTLET INTO AN UNDISTURBED STABILIZED AREA AT NON-EROSIVE VELOCITY.

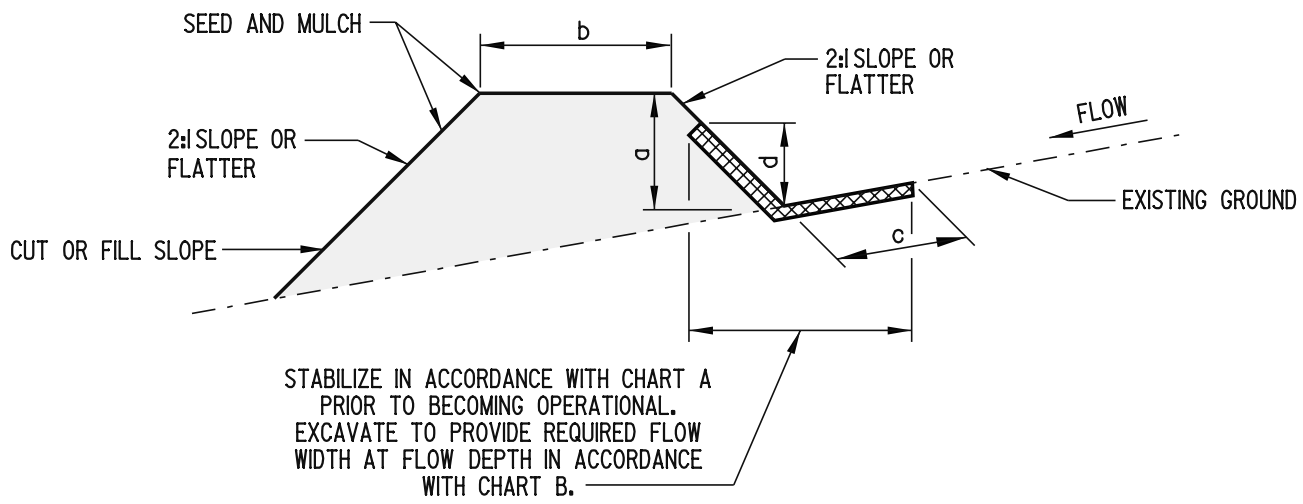
3). IF PERIMETER DIKE SWALES ARE TO BE OPERATIONAL FOR MORE THAN 14 DAYS, THEY SHALL BE STABILIZED IN ACCORDANCE WITH CHART A PRIOR TO BECOMING OPERATIONAL.

4). IF TEMPORARY SWALES OR CLEAN WATER DIVERSIONS ARE TO BE OPERATIONAL FOR LESS THAN 14 DAYS, THEY SHALL BE STABILIZED WITH GEOTEXTILE IN ACCORDANCE WITH THE STANDARD DETAIL, "GEOTEXTILE-LINED CHANNEL DIVERSION".

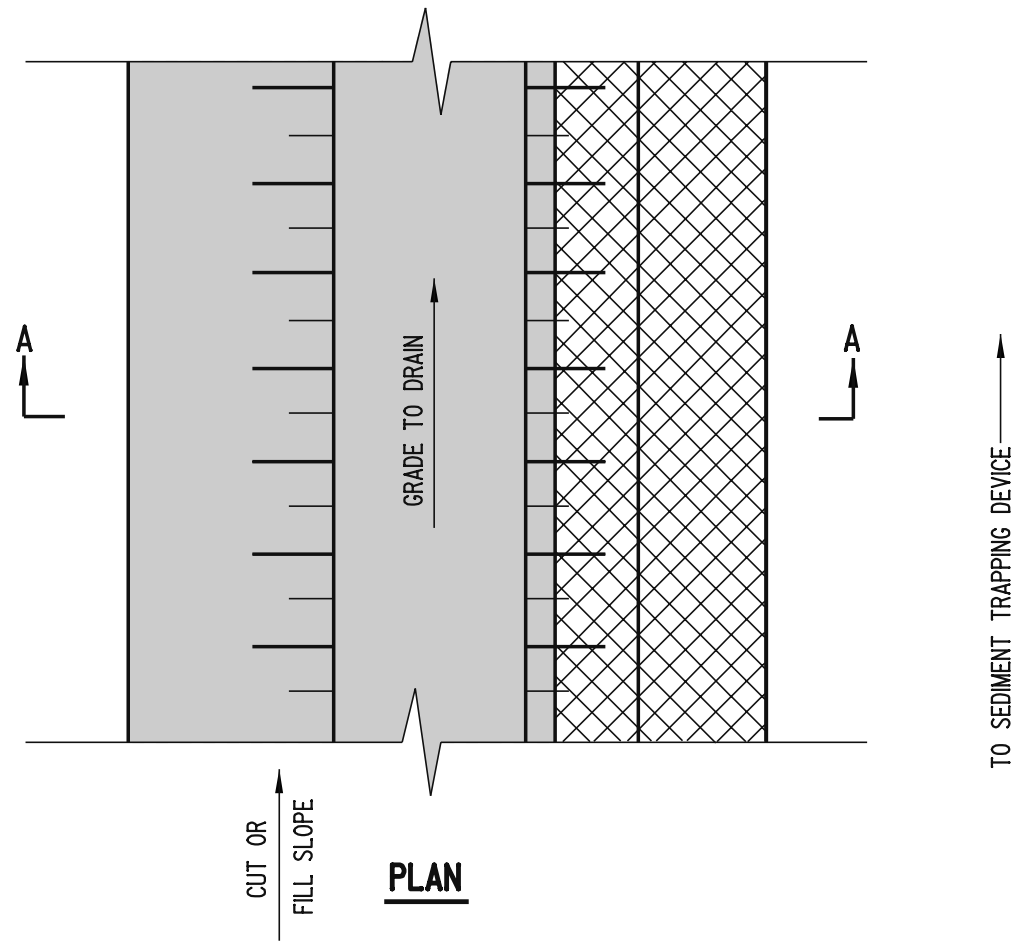
| DELAWARE DEPARTMENT OF TRANSPORTATION | PERIMETER DIKE / SWALE | | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|---|
| | STANDARD NO. E-12 (2005) | SHT. 1 | OF 1 | RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE |

09/02/2005

SCALE : N.T.S.




## SECTION A-A




## PLAN

| CHART A - FLOW CHANNEL STABILIZATION | | |
|---|---|---|
| TYPE | CHANNEL GRADE | TYPE OF TREATMENT |
| 1 | 0.5-2.0% | SEED AND EROSION CONTROL BLANKET |
| 2 | 2.1-8.0% | R-4 RIPRAP |
| 3 | 8.1-20% | ENGINEERED DESIGN |

| CHART B - EARTH DIKE DIMENSIONS | | |
|---|---|---|
| SYMBOL | DIKE A (5 ac (2 ha) or less) | DIKE B (5-10ac(2-4 ha)) |
| a-DIKE HEIGHT | 12" (300) | 18" (450) |
| b-DIKE WIDTH | 12" (300) | 24" (600) |
| c-FLOW WIDTH | 48" (1200) | 72" (1800) |
| d-FLOW DEPTH | 14" (350) | 27" (680) |

**NOTES:** 1). IF DESIRED, TOP WIDTH MAY BE WIDER AND SIDE SLOPES MAY BE FLATTER TO FACILITATE CROSSING BY CONSTRUCTION TRAFFIC.

2). FIELD LOCATION SHOULD BE ADJUSTED AS NEEDED TO INSURE A STABILIZED OUTFALL.

DELAWARE
DEPARTMENT OF TRANSPORTATION

EARTH DIKE

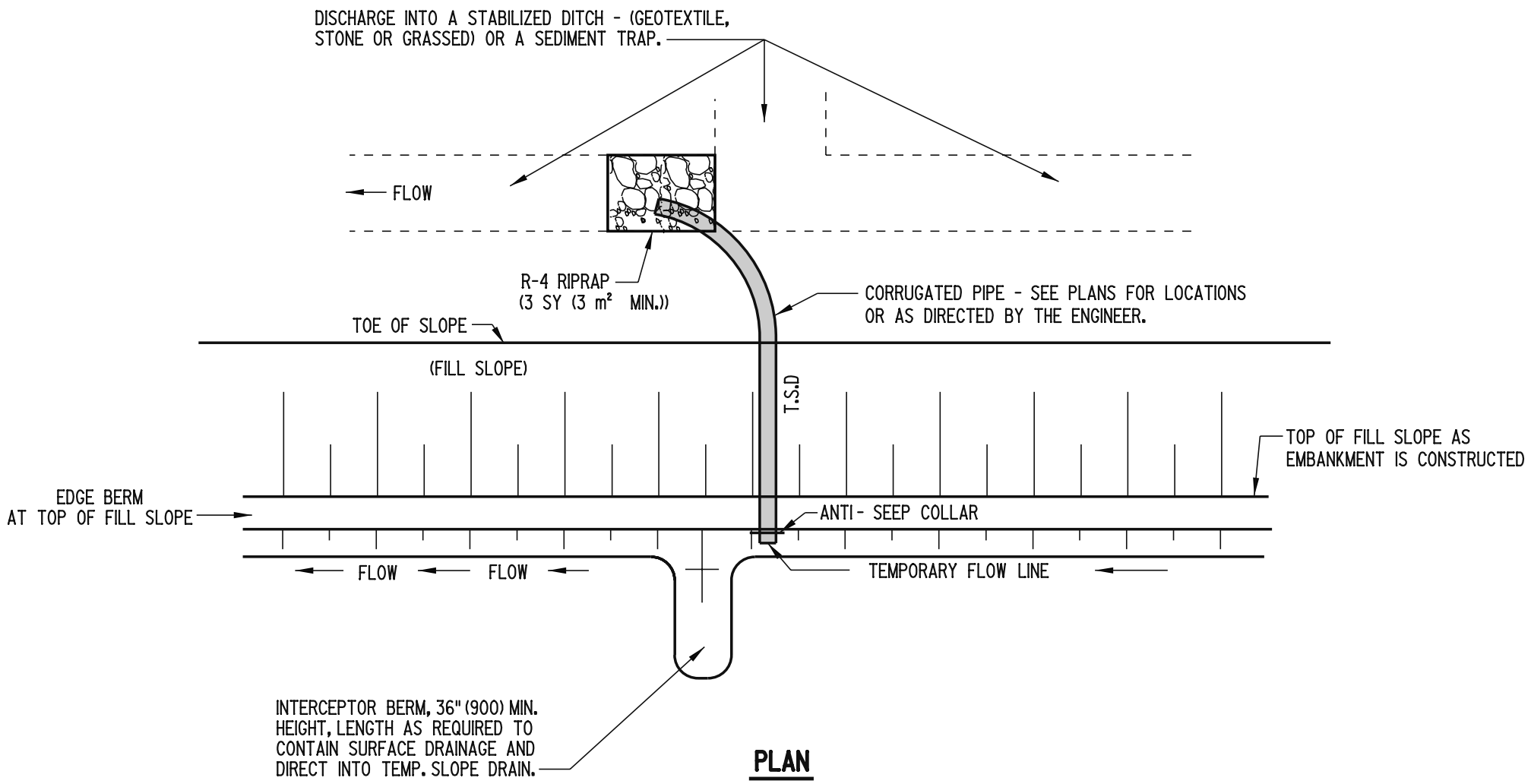
STANDARD NO. E-13 (2005) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE

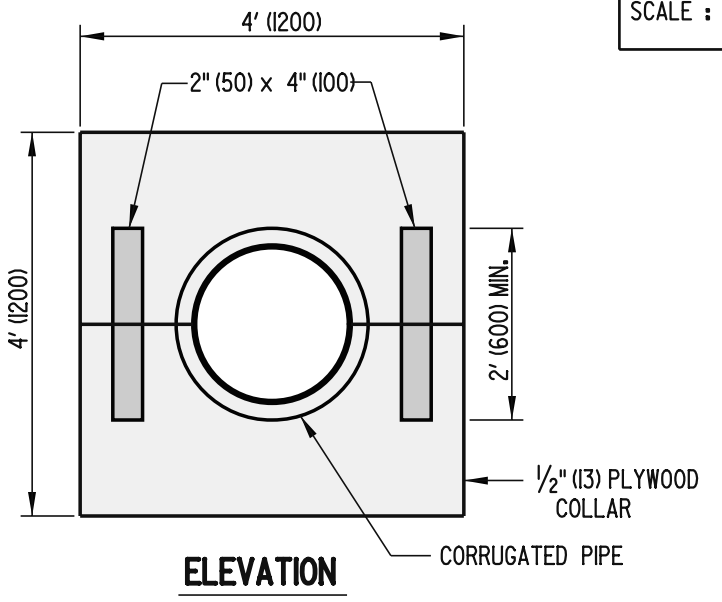
RECOMMENDED James M. O'Neill DESIGN ENGINEER 11/29/05 DATE

09/02/2005

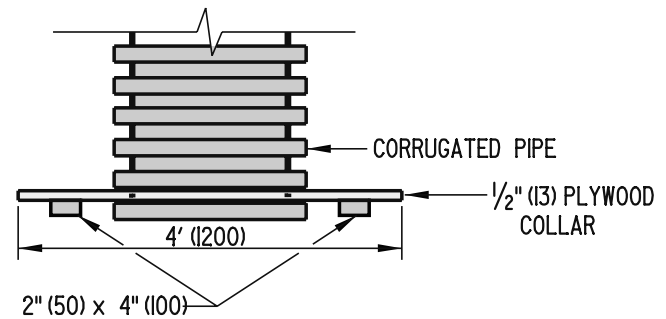
SCALE : N.T.S.




**PLAN**

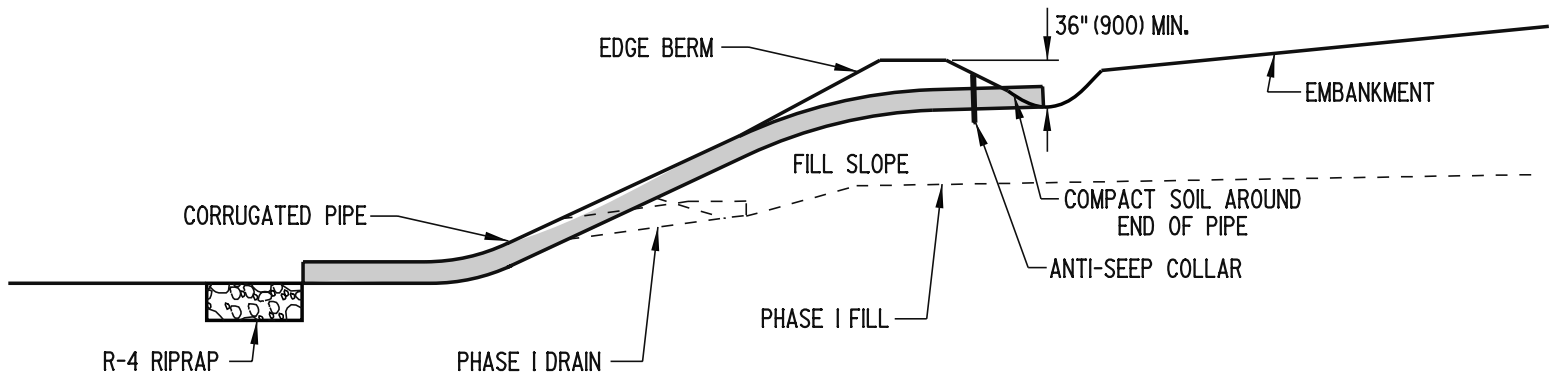



**ELEVATION**




**PLAN**

**ANTI-SEEP COLLAR**




**SLOPE DRAIN PROFILE**

**(FOR FILL SLOPES)**

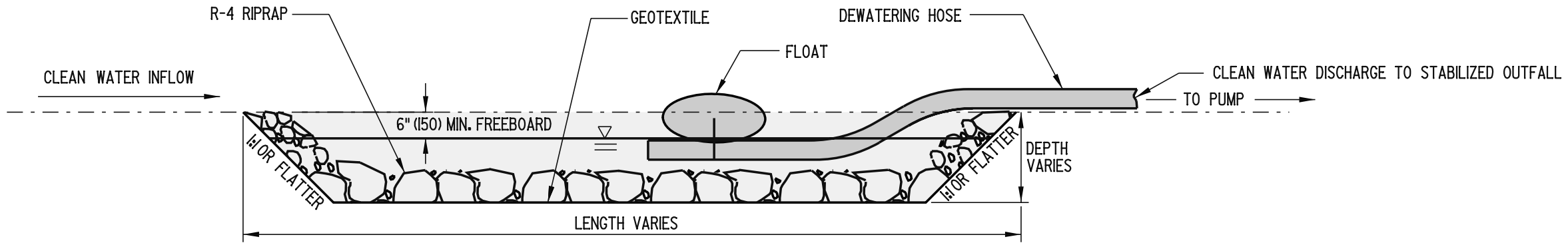
**NOTES:** 1). ALL TEMPORARY SLOPE DRAINS SHALL DISCHARGE INTO THE BACK OF SEDIMENT TRAPS, INTO SEDIMENT BASINS OR DITCHES DISCHARGING INTO TRAPS OR BASINS.

2). TEMPORARY SLOPE DRAINS SHALL BE USED AT THE TOP OF FILL SLOPES AS EMBANKMENT IS CONSTRUCTED, TO PREVENT EXCESSIVE EROSION UNTIL SHOULDERS ARE CONSTRUCTED AND THE SLOPES ARE SEEDED AND MULCHED.

| DELAWARE DEPARTMENT OF TRANSPORTATION | TEMPORARY SLOPE DRAIN | | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|---|
| | STANDARD NO. E-14 (2005) | SHT. 1 | OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

09/02/2005

SCALE : N.T.S.



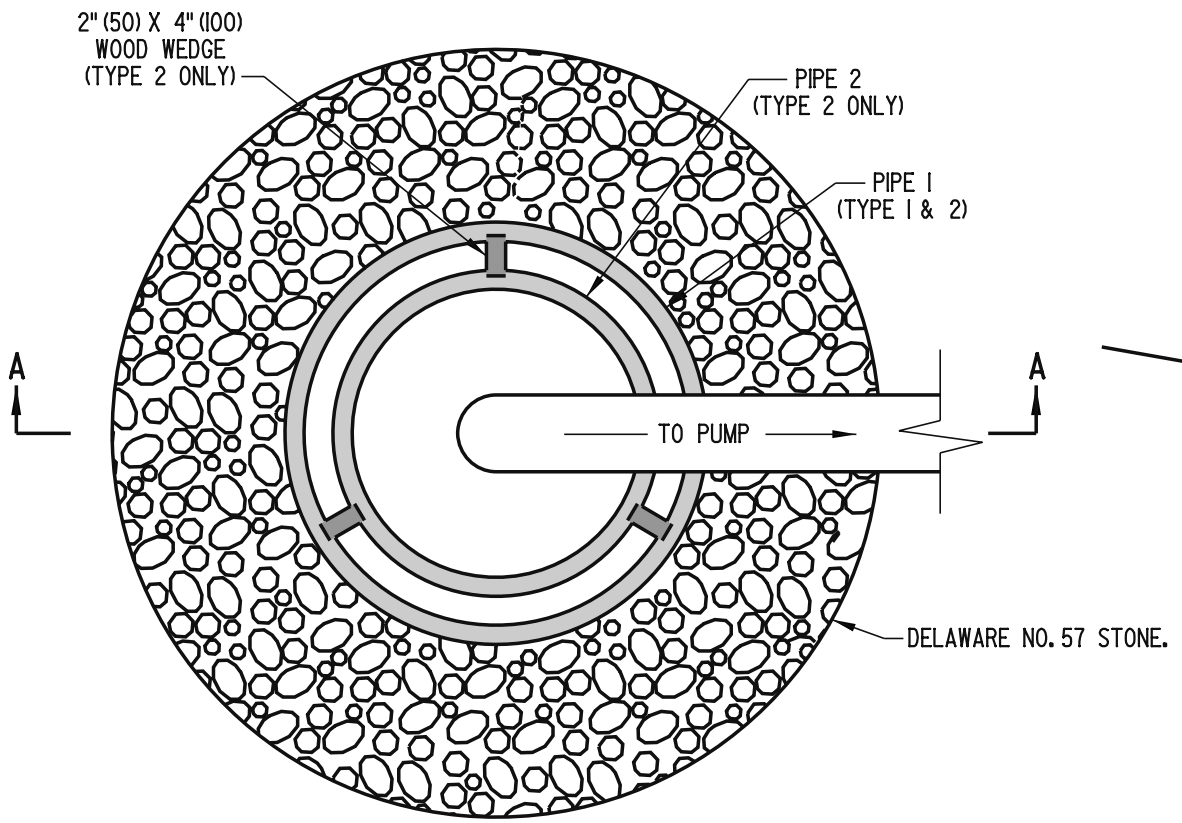

**NOTES:** 1). THE WORK SHALL CONSIST OF CONSTRUCTING A STILLING WELL FOR THE PURPOSE OF PUMPING CLEAN WATER AROUND A DISTURBED CONSTRUCTION AREA TO A STABILIZED OUTFALL.

2). THE DIMENSIONS OF THE STILLING WELL SHALL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

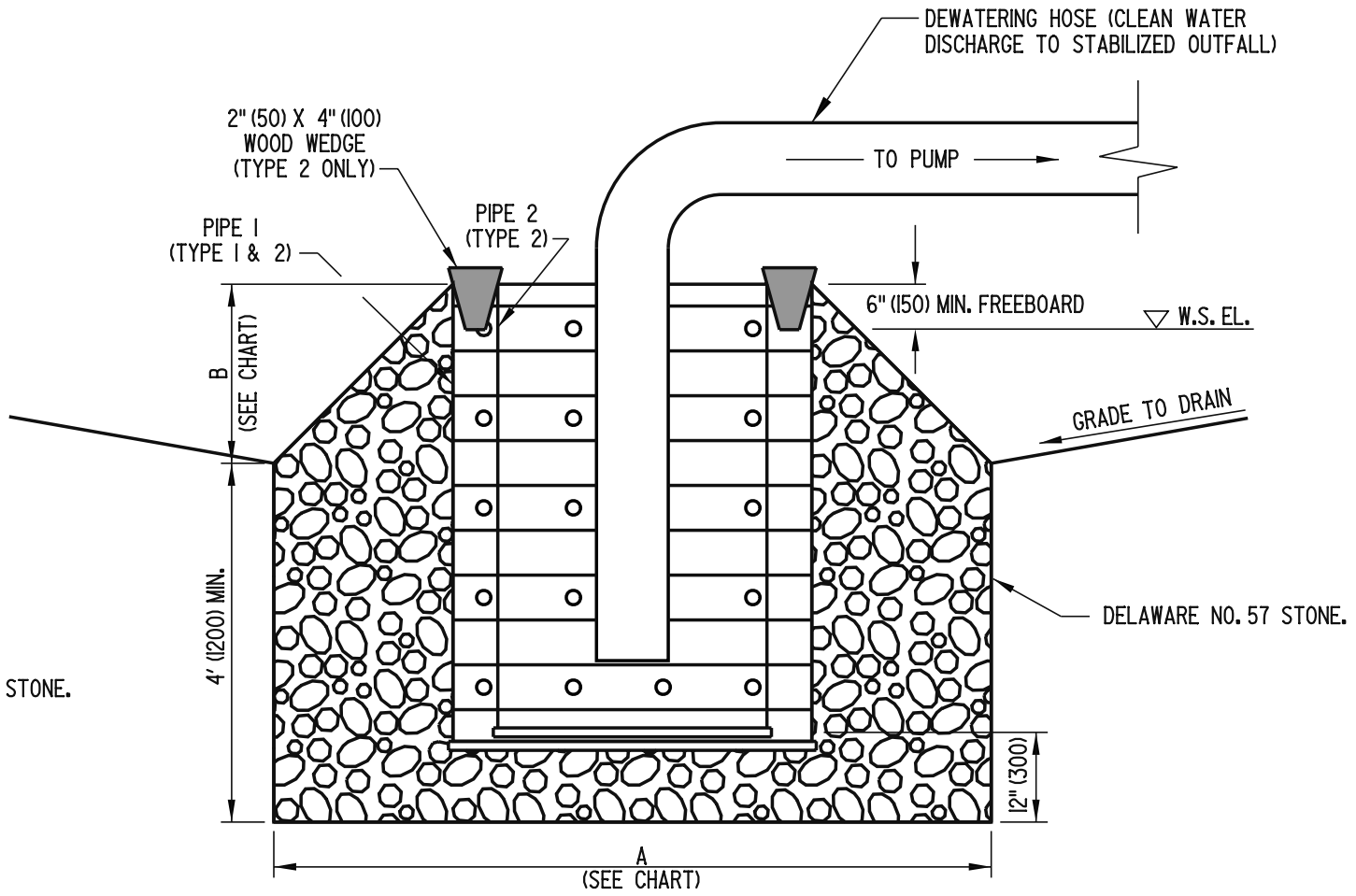
| DELAWARE DEPARTMENT OF TRANSPORTATION | STILLING WELL | | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
|---|---|---|---|
| | STANDARD NO. E-15 (2005) | SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

09/07/2005

SCALE : N.T.S.




PLAN




SECTION A-A

| SUMP PIT CHART | | | | |
|---|---|---|---|---|
| TYPE | PIPE 1 | PIPE 2 | A | B |
| 1 | PERFORATED 24" (600) CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE. | N/A | 4' (1200) MIN. | 12" (300) |
| 2 | PERFORATED 48" (1200) CMP WITH PERFORATED CAP WELDED ON BOTTOM | REMOVABLE PERFORATED 36" (900) CMP WITH PERFORATED CAP WELDED ON BOTTOM AND COMPLETELY WRAPPED WITH GEOTEXTILE. | 8' (2400) MIN. | 24" (600) |

**NOTES:**

1). THE WORK SHALL CONSIST OF CONSTRUCTING A SUMP PIT FOR THE PURPOSE OF FILTERING AND PUMPING WATER TO A STABILIZED OUTFALL.

2). GEOTEXTILE FOR THE 36" (900) CMP SHALL BE REPLACED WHEN CLOGGED WITH SEDIMENT.

3). ½" x ½" (13 x 13) 19 GAGE (I.I) WIRE MESH SHALL BE PLACED AROUND THE REMOVABLE 36" (900) CMP BEFORE ATTACHING THE GEOTEXTILE TO INCREASE FLOW THROUGH THE GEOTEXTILE.

4). ALL PERFORATIONS SHALL BE 1" (25) IN DIAMETER AND 12" (300) ON CENTER IN ALL DIRECTIONS.

5). TYPE 1 SUMP PIT SHALL BE USED ONLY WHEN PUMPING IS NEEDED FOR LESS THAN 7 DAYS.

DELAWARE
DEPARTMENT OF TRANSPORTATION

SUMP PIT, TYPE 1 & 2

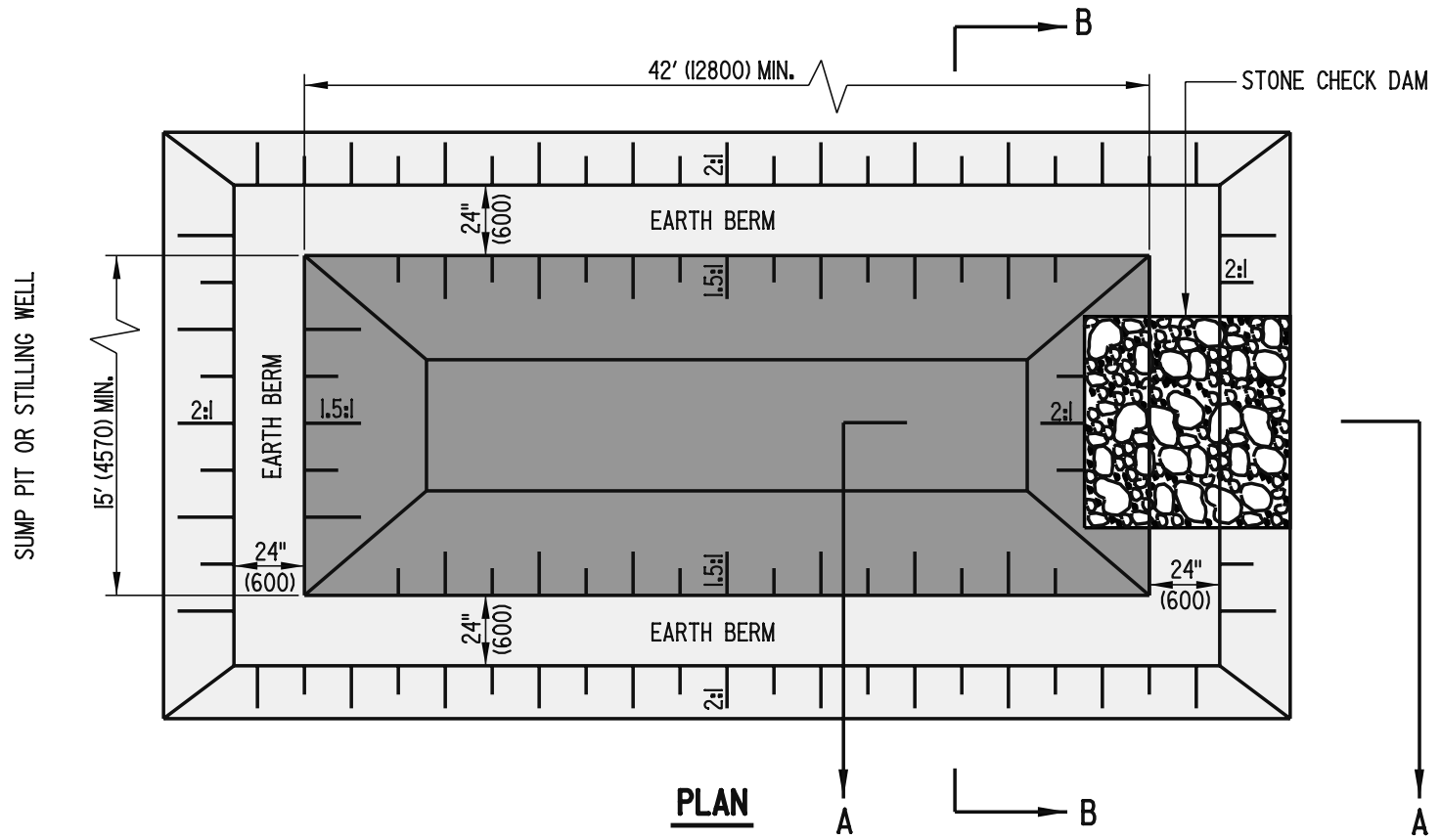
STANDARD NO. E-16 (2005) | SHT. 1 OF 1

APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE

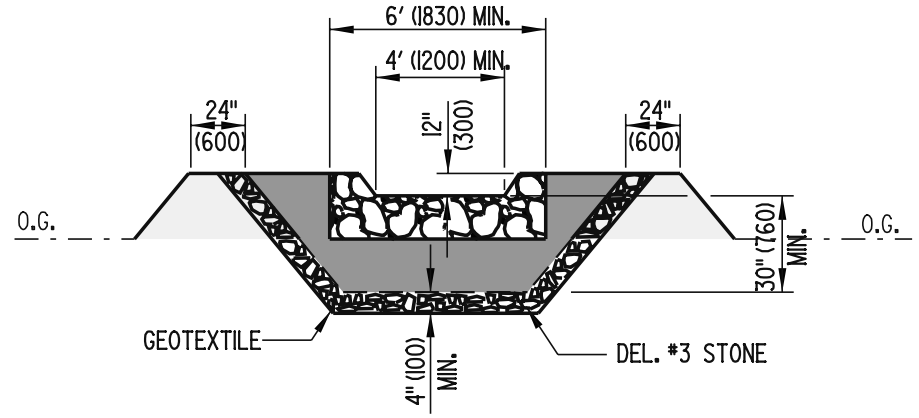
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09/07/2005

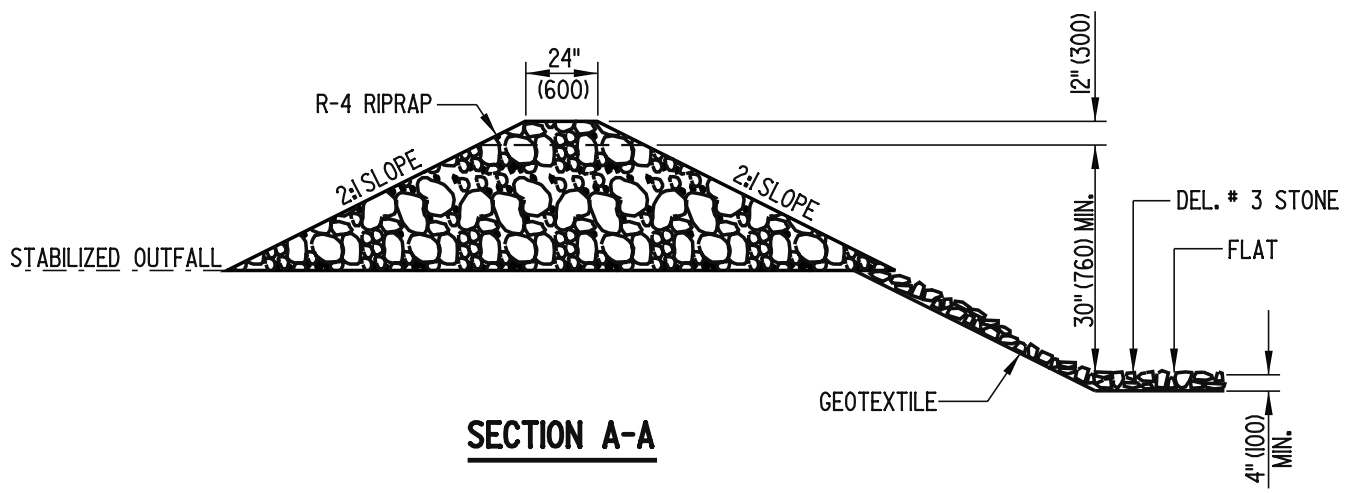
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PLAN




SECTION B-B




SECTION A-A

**NOTES:** 1.) A DEWATERING BASIN (DWB) IS USED TO REMOVE SEDIMENT FROM SEDIMENT-LADEN WATER PUMPED FROM A CONSTRUCTION SITE BEFORE THE WATER RE-ENTERS THE WATERWAY. THE DWB SHALL HAVE A MINIMUM TOP WIDTH OF 15' (4570) AND A MINIMUM DEPTH OF 3.5' (1065). THE MINIMUM TOP LENGTH SHOWN IN THE PLAN IS USED ONLY FOR QUANTITY CALCULATIONS BY THE ENGINEER. THE ACTUAL TOP LENGTH IN THE FIELD SHALL BE CALCULATED BY THE EQUATION:

US CUSTOMARY : TOP LENGTH (FEET) = 26' + .01 x Y
METRIC : TOP LENGTH (mm) = 7930 + 48300 x Y

WHERE Y IS THE MAXIMUM CAPACITY IN GALLONS PER MINUTE (CUBIC METERS PER SECOND) OF THE DEWATERING PUMP.

2.) THE OUTFALL FROM THE BASIN TO THE RECEIVING WATERS SHALL BE STABILIZED. PUMPING INTO THE DWB SHALL CEASE WHEN THE EFFLUENT FROM THE BASIN BECOMES SEDIMENT-LADEN.

3.) A SUMP PIT OR STILLING WELL (SEE STANDARD SHEETS) SHALL BE USED IN CONJUNCTION WITH A DWB. THE BASIN MAY BE BYPASSED INTO THE STABILIZED OUTFALL IF THE WATER BEING PUMPED IS NON-SEDIMENT-LADEN. DIRECT DISCHARGE TO THE RECEIVING WATERS SHALL CEASE AND BE REDIRECTED TO THE DWB WHEN EFFLUENT FROM THE PUMP BECOMES SEDIMENT-LADEN.

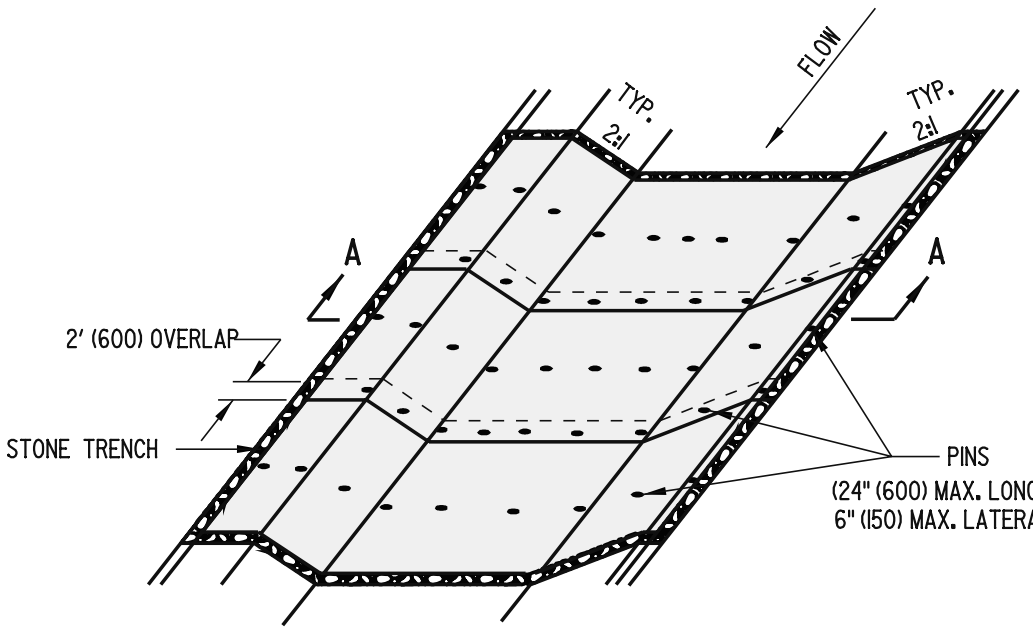
4.) MAINTENANCE MUST BE PERFORMED IN ORDER FOR THE DWB TO FUNCTION PROPERLY. ACCUMULATED SEDIMENT SHALL BE REMOVED AND DISPOSED OF IN AN APPROVED DISPOSAL AREA WHEN THE BASIN IS FILLED TO WITHIN 12" (300) FROM THE CREST.

5.) WHEN USED IN CONJUNCTION WITH A COFFERDAM, DEWATERING SHALL BEGIN NO SOONER THAN 12 HOURS AFTER COFFERDAM INSTALLATION IN ORDER TO ALLOW SEDIMENT PRODUCED DURING INSTALLATION TO SETTLE COMPLETELY.

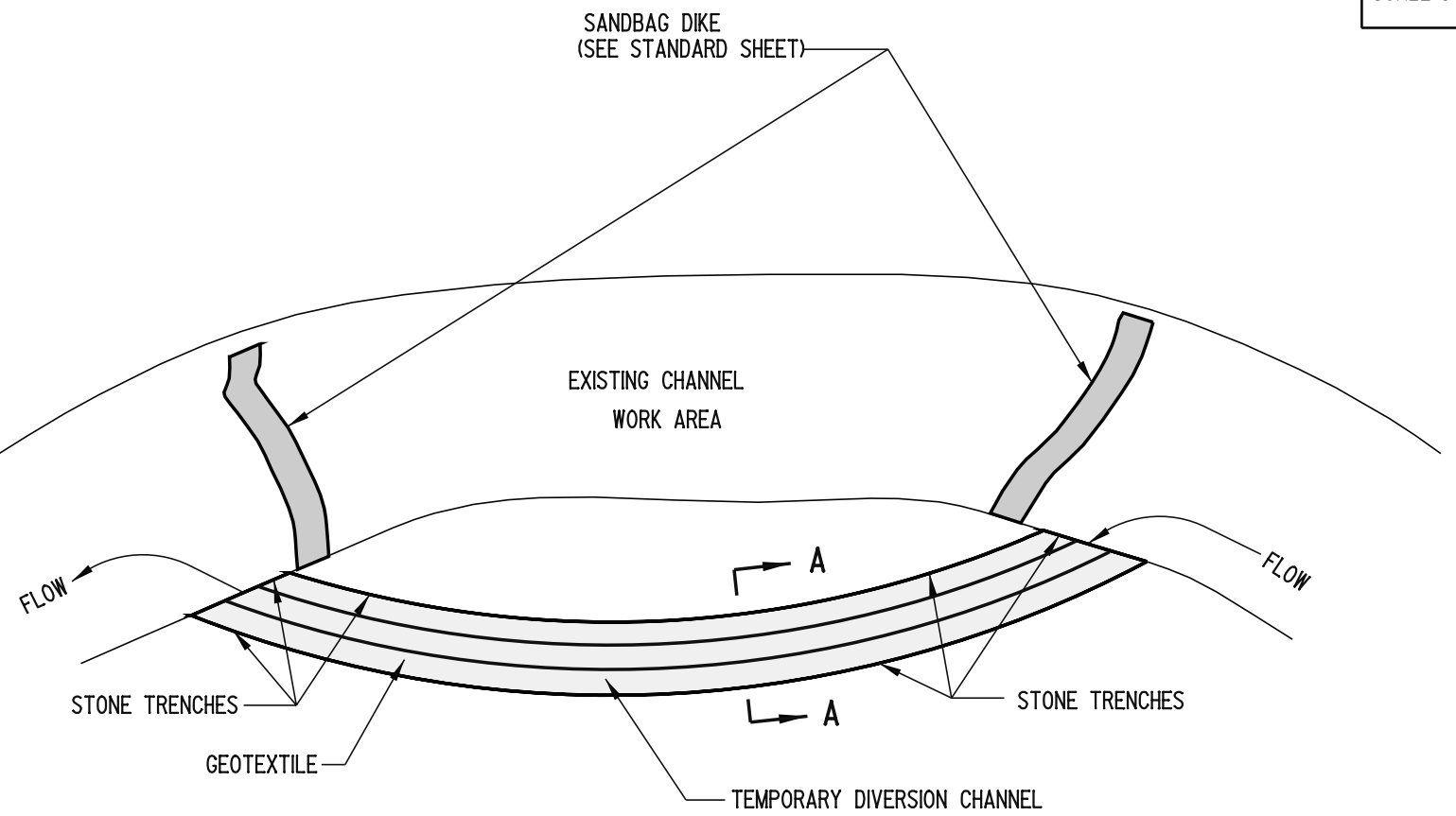
| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | DEWATERINGBASIN | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. E-17 (2005) SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

09/07/2005

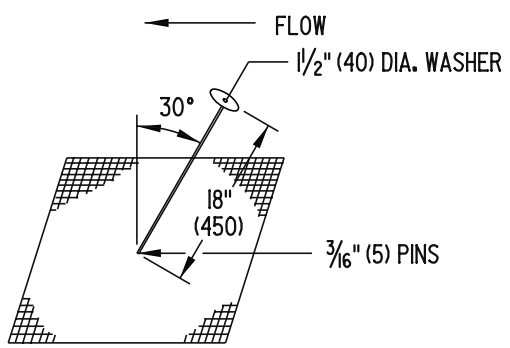
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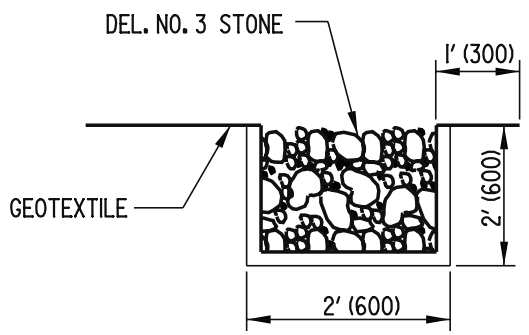

**OBLIQUE VIEW**



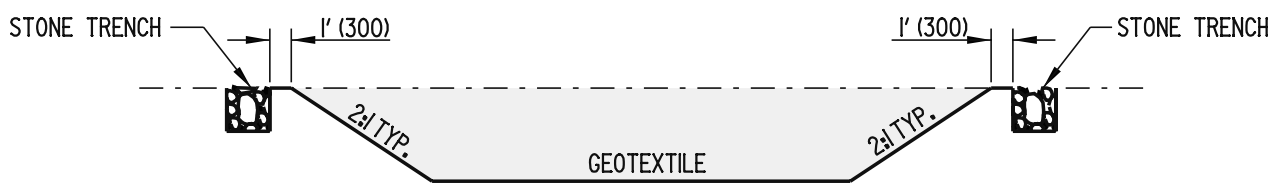

**PLAN**




**FASTENING DETAIL**




**TRENCHING DETAIL**




**SECTION A-A**

NOTE: SEE PLANS FOR LOCATION, DIMENSIONS, GRADES, ETC.

| | | |
|---|---|---|
| DELAWARE DEPARTMENT OF TRANSPORTATION | GEOTEXTILE-LINED CHANNEL DIVERSION | APPROVED Carolann Wicks CHIEF ENGINEER 12/5/05 DATE |
| | STANDARD NO. E-18 (2005) SHT. 1 OF 1 | RECOMMENDED DESIGN ENGINEER 11/29/05 DATE |

09/08/2005