

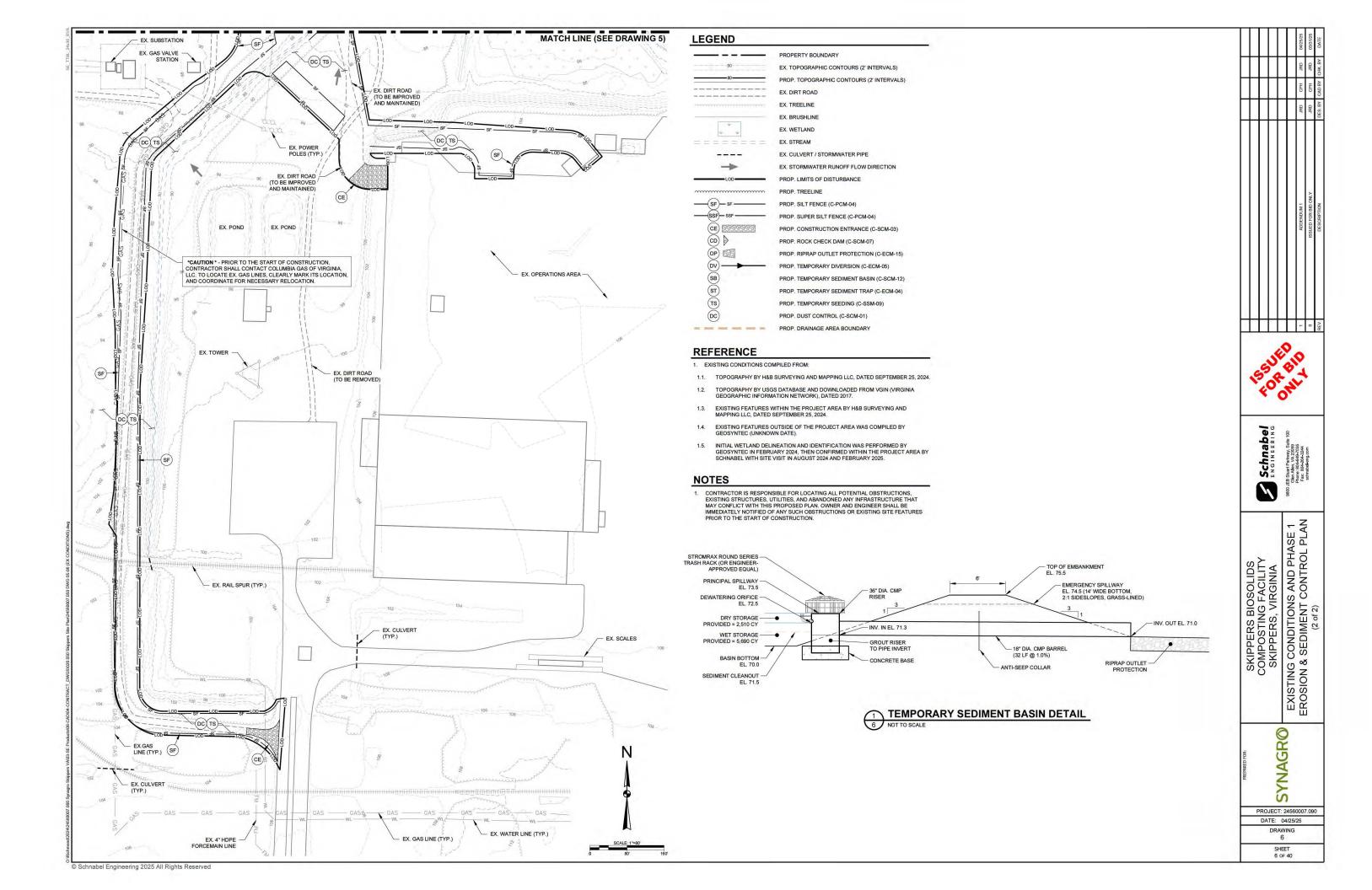


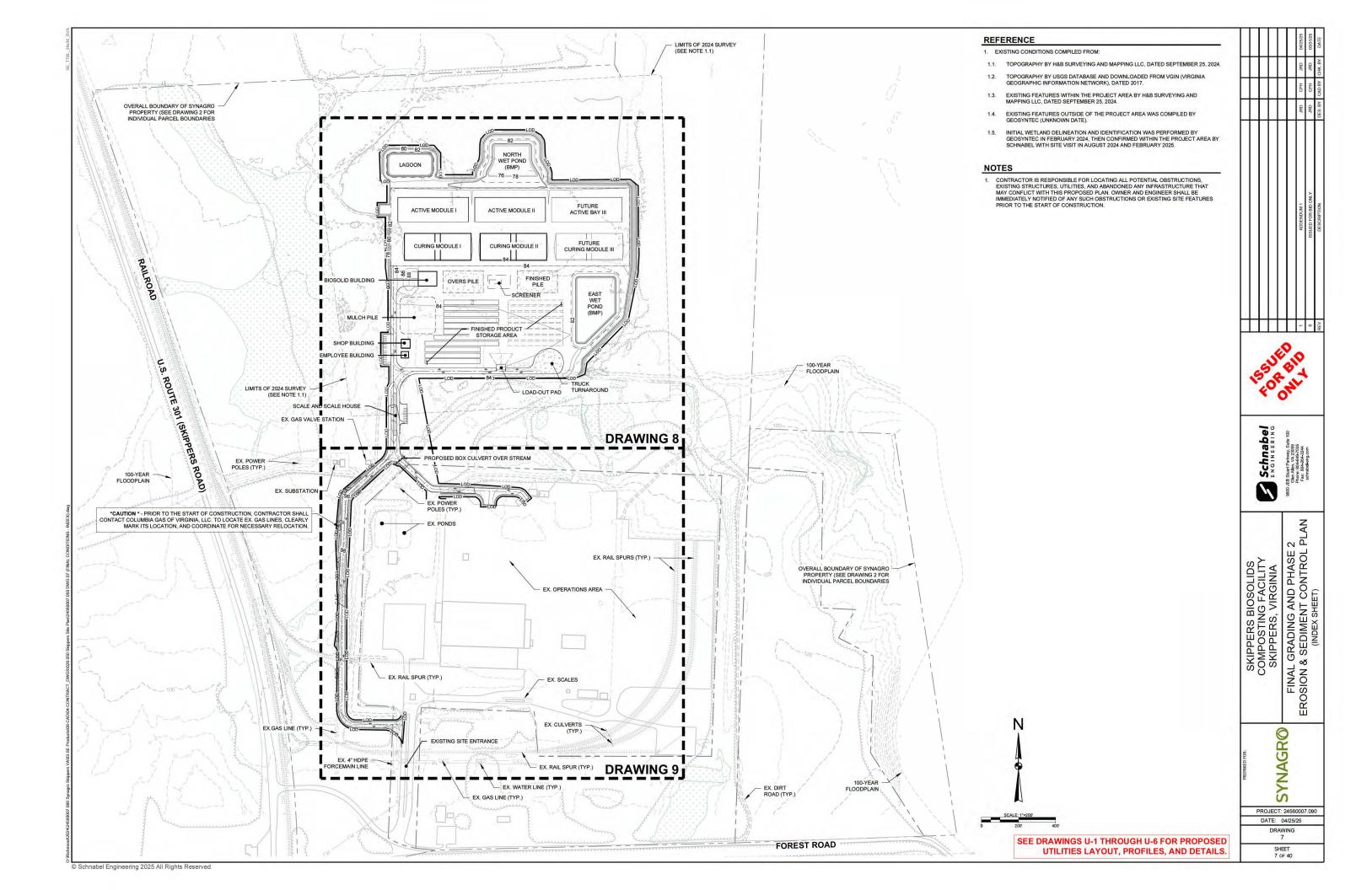
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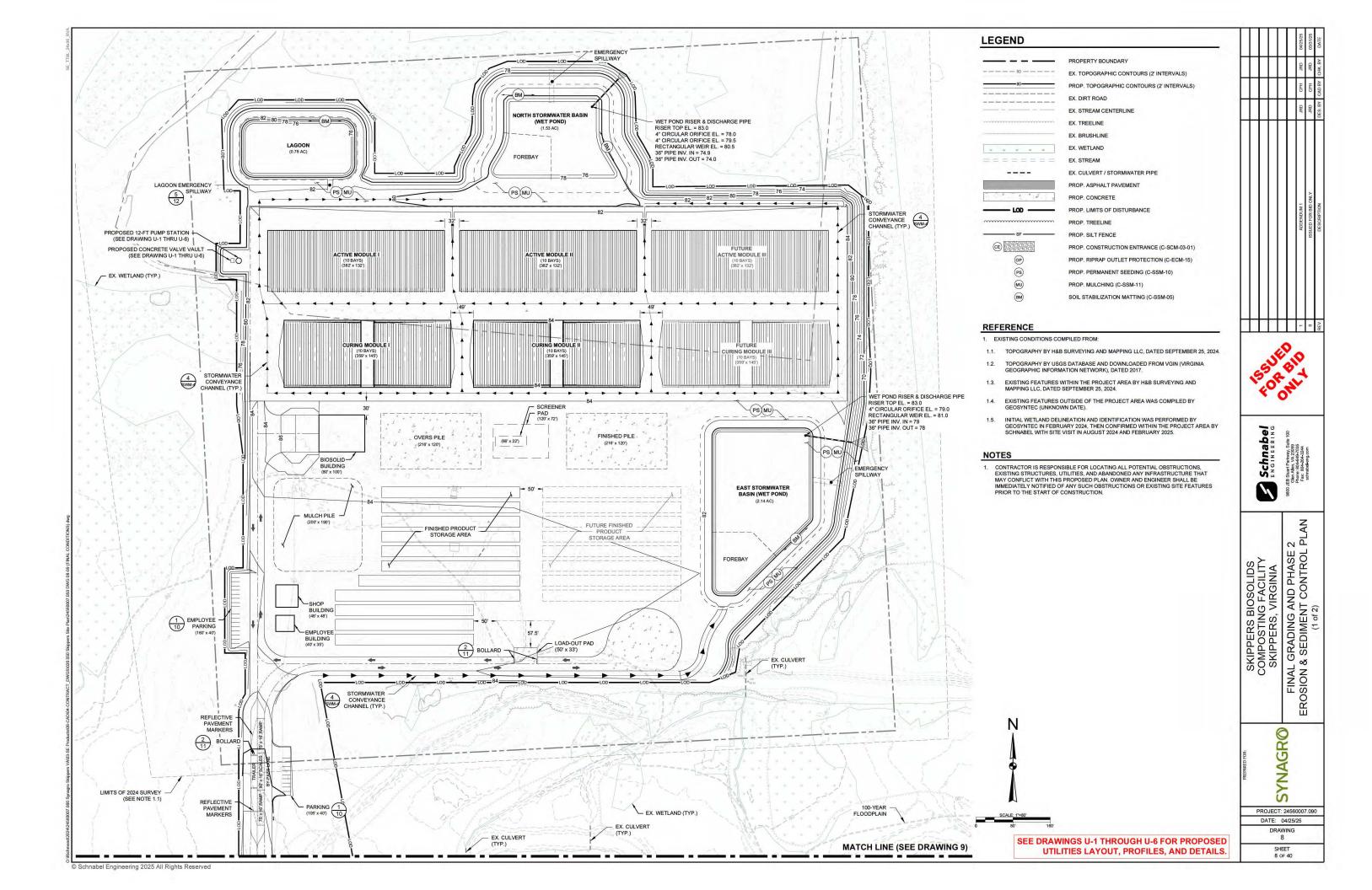
EXISTING CONDITIONS AND PHASE 1 EROSION & SEDIMENT CONTROL PLAN (1 of 2) SKIPPERS BIOSOLIDS COMPOSTING FACILITY SKIPPERS, VIRGINIA

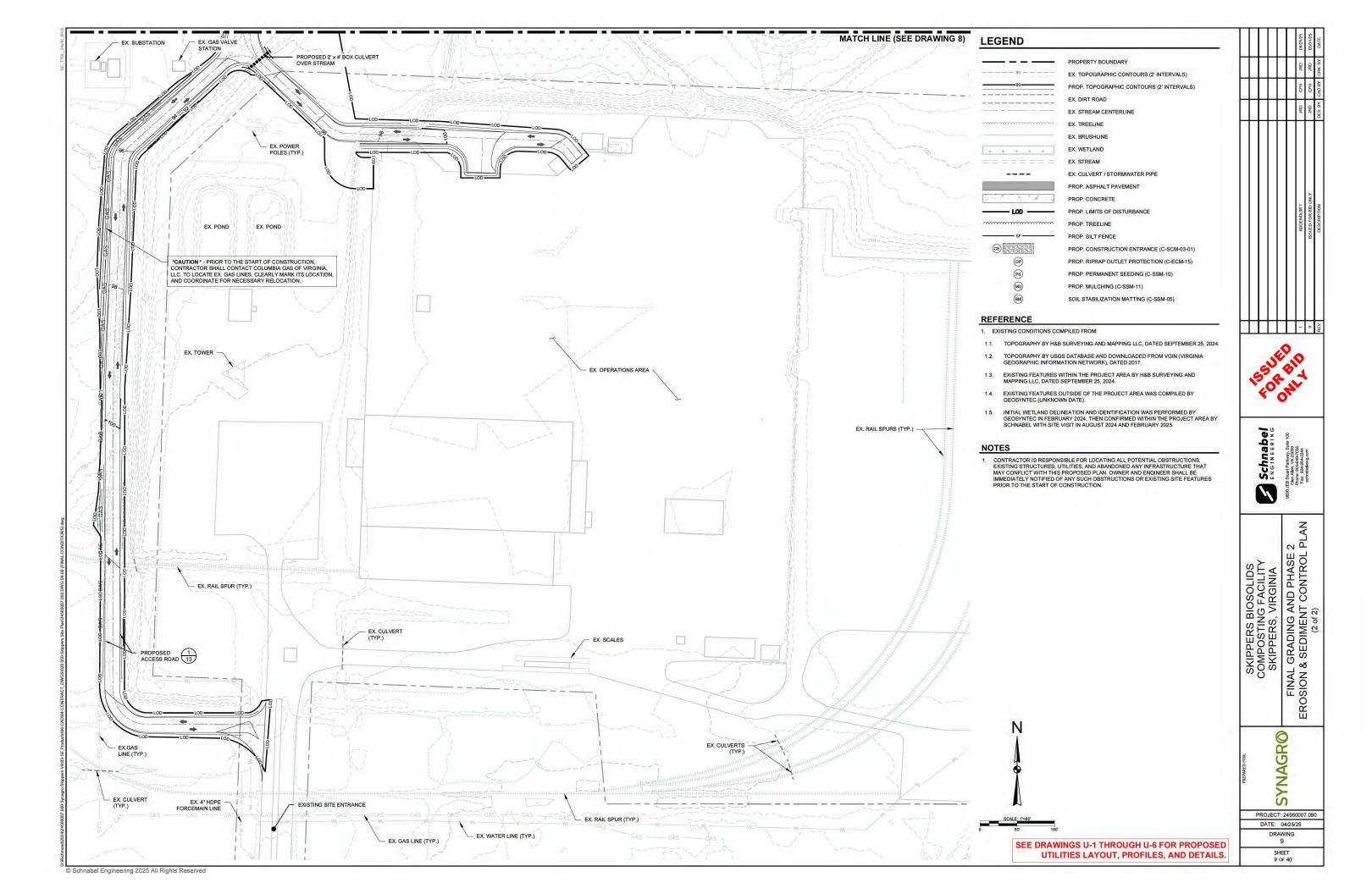
SYNAGRO

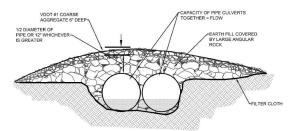
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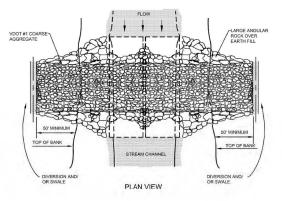






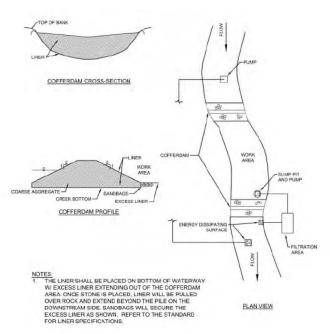


#### ELEVATION



# TEMPORARY CULVERT CROSSING DETAIL

C-ENV-03-2 SOURCE: VIRGINIA STORMWATER MANAGEMENT HANDBOOK (VSMH) V1. NOT TO SCALE



## TEMPORARY STREAM CROSSING NOTES

#### STORMWATER PERFORMANCE MINIMUM STANDARDS

MS-12: WATERCOURSE CONSTRUCTION - WHEN WORK IN A LIVE WATERCOURSE IS PERFORMED, PRECAUTIONS WILL BE TAKEN TO MINIMIZE ENCROACHMENT, CONTROL SEDIMENT TRANSPORT, AND STABILIZE THE WORK AREA TO THE GREATEST EXTENT POSSIBLE DURING CONSTRUCTION. NON-ERODIBLE WATERIAL WILL BE USED FOR THE VIRGINIA STORMWATER MANAGEMENT HANDBOOK, VERSION 1.1 CHAPTER 7-204 CONSTRUCTION OF CAUSEWAYS AND COFFERDAMS. EARTHEN FILL MAY BE USED FOR THESE STRUCTURES IF ARMORED BY NON-ERODIBLE COVER MATERIALS

MS-13: TEMPORARY VEHICULAR STREAM CROSSING - WHEN A LIVE WATERCOURSE MUST BE CROSSED BY CONSTRUCTION VEHICLES MORE THAN TWICE IN ANY 6-MONTH PERIOD, A TEMPORARY VEHICULAR STREAM CROSSING CONSTRUCTED OF NON-ERODIBLE MATERIAL SHALL BE PROVIDED.

MS-14: OTHER WATERCOURSE REGULATIONS - ALL APPLICABLE FEDERAL, STATE, AND LOCAL REQUIREMENTS PERTAINING TO WORKING IN OR CROSSING LIVE WATERCOURSES WILL BE MET.

MS-15: BED AND BANK STABILIZATION - THE BED AND BANKS OF A WATERCOURSE SHALL BE STABILIZED IMMEDIATELY

## C-ENV-03-2 TEMPORARY CULVERT CROSSING DESIGN CRITERIA

CONSTRUCTION - USE VIRGINIA DEPARTMENT OF TRANSPORTATION (VDOT) COARSE AGGREGATES TO FORM THE CROSSING AS FOLLOWS:

- 1. PIPE BEDDING MATERIAL (FULL EMBEDMENT OF PIPE COMPACTED) VDOT #57 AGGREGATE
- 2. PIPE BEDDING COVER MATERIAL (MINIMUM 12" THICK) VDOT #1 AGGREGATE
- 3. TRAVEL SURFACE MATERIAL (MINIMUM 6" THICK) VDOT #3 AGGREGATE
- 4. AGGREGATE MATERIALS SHALL BE UNDERLAIN BY AN 8-OZ. NON-WOVEN GEOTEXTILE PLACED DIRECTLY ON EXISTING GRADE

CAPACITY - CULVERT SIZED TO PASS THE 10-YEAR STORM EVENT FOR A CONSTRUCTION DURATION OF UP TO ONE YEAR CULVERT SIZE - ONE 38-INCH DIAMETER N-12 HDPE CORRUGATED EXTERIOR WITH SMOOTH WALLED INTERIOR SOIL TIGHT JOINTED PIPE.

LOAD CAPACITY - DESIGN LOADING IS H20 AT FULL PIPE EMBEDMENT DEPTH WITH A MINIMUM OF 12" OF AGGREGATE COVERING

PIPE SLOPE - CONFORM TO EXISTING CHANNEL BED.

PIPE LENGTH - PIPE LENGTH SHALL BE NO GREATER THAN 20 FEET IN LENGTH.

CROSSING ALIGNMENT - CROSSING ALIGNMENT SHALL BE NO GREATER THAN 15-DEGREES FROM PERPENDICULAR TO THE PIPE.

ROADWAY APPROACH - ROADWAY APPROACHES SHALL BE A MINIMUM DISTANCE OF 50 FEET FROM EACH BANK OF THE STREAM CROSSING. AGGREGATE APPROACH SHALL BE AS FOLLOWS:

- 1. TRAVEL SURFACE MATERIAL (MINIMUM 6" THICK) VDOT #3 AGGREGATE
- 2. AGGREGATE MATERIALS SHALL BE UNDERLAIN BY AN 8-OZ. NON-WOVEN GEOTEXTILE PLACED DIRECTLY ON EXISTING
- 3. MINIMUM WIDTH SHALL BE THAT OF THE CROSSING TRAVEL SURFACE.
- 4 CONSTRUCT ROADWAY APPROACHED WITH A REVERSE GRADE AWAY FROM THE CROSSING AND WATER WAY

## C-ENV-03-2 TEMPORARY CULVERT CROSSING CONSTRUCTION SPECIFICATIONS

- KEEP CLEARING AND EXCAVATION OF THE STREAM BED AND BANKS TO A MINIMUM.
- 2. INSTALL THE INVERT ELEVATION OF THE CULVERT ON THE NATURAL STREAMBED GRADE
- PLACE FILTER FABRIC ON THE STREAMBED AND STREAMBANKS BEFORE PLACEMENT OF THE PIPE CULVERT AND AGGREGATE. ENSURE THE FILTER FABRIC COVERS THE STREAMBED AND EXTEND THE FILTER FABRIC A MINIMUM OF 6 INCHES AND A MAXIMUM OF 1 FOOT BEYOND THE END OF THE CULVERT AND BEDDING MATERIAL.
- 4. EXTEND THE CULVERT(S) A MINIMUM OF 1 FOOT BEYOND THE UPSTREAM AND DOWNSTREAM TOES OF THE AGGREGATE PLACED AROUND THE CULVERT. ENSURE THE CULVERT LENGTH DOES NOT EXCEED 20 FEET.
- COVER THE CULVERT(S) WITH A MINIMUM OF 1 FOOT OF AGGREGATE. AT A MINIMUM, ENSURE THE BEDDING AND FILL
  MATERIAL USED IN THE CONSTRUCTION OF THE TEMPORARY ACCESS CULVERT CROSSINGS CONFORMS WITH THE
  AGGREGATE REQUIREMENTS CITED IN DESIGN CRITERIA ABOVE.
- 6. WHEN THE CROSSING HAS SERVED ITS PURPOSE, REMOVE ALL STRUCTURES INCLUDING CULVERTS, BEDDING, AND FILTER FABRIC MATERIALS. REMOVE THE STRUCTURE AND CLEAN UP THE AREA WITHOUT CONSTRUCTION EQUIPMENT WORKING IN THE WATERWAY CHANNEL CONSIDER THE NEED FOR INSPECTIONS AND REPAIRS PRIOR TO PERMIT TERMINATION BEFORE THE CROSSING IS REMOVED.
- 7. UPON REMOVAL OF THE STRUCTURE, IMMEDIATELY SHAPE THE STREAM TO ITS ORIGINAL CROSS-SECTION AND PROPERLY STABILIZE WITH SEED AND EROSION CONTROL MATTING.
- 8. THE USE OF TEMPORARY COFFERDAMS IN ACCORDANCE WITH STANDARD C-ENV-05 COFFERDAM CROSSING MAY BE NECESSARY SHOULD FLOW EXIST IN THE STREAM AT THE TIME OF TEMPORARY CULVERT CROSSING INSTALLATION OR REMOVAL. IMPERMEABLE BARRIER COFFERDAM TYPES WOULD BE CONSIDERED APPROPRIATE FOR THIS SPECIFIC APPLICATION. CONTRACTOR SHALL COORDINATE WITH THE ENGINEER PRIOR TO THE USE OF COFFERDAM TO ENSURE THE DESIGN AND PLACEMENT IS IN ACCORDANCE WITH THE C-ENV-05 COFFERDAM

# C-ENV-03-2 TEMPORARY CULVERT CROSSING MAINTENANCE

- . INSPECT TEMPORARY VEHICULAR STREAM CROSSINGS AFTER EVERY RAINFALL AND AT LEAST ONCE A WEEK, WHETHER IT HAS RAINED OR NOT, AND REPAIR ALL DAMAGE IMMEDIATELY.
- INSPECT STREAM FOR BANK EROSION AND IN-STREAM DEGRADATION. IF BANK EROSION OCCURS, STABILIZE BANKS
  USING EROSION CONTROL PRACTICES SUCH AS EROSION CONTROL BLANKETS. IF IN-STREAM DEGRADATION IS
  OCCURRING, ARMOR THE CULVERT OUTLET(S) WITH RIPRAP TO DISSIPATE ENERGY. IF SEDIMENT IS ACCUMULATING
  UPSTREAM OF THE CROSSING, REMOVE EXCESS SEDIMENT AS NEEDED TO MAINTAIN THE FUNCTIONALITY OF THE
  CROSSING.
- REMOVE THE TEMPORARY CROSSING WHEN IT IS NO LONGER NEEDED FOR CONSTRUCTION. TAKE CARE TO MINIMIZE THE AMOUNT OF SEDIMENT LOST INTO THE STREAM UPON REMOVAL. ONCE THE CROSSING HAS BEEN REMOVED, STABILIZE THE STREAM BANKS WITH SEFED AND FROSION CONTROL BI ANKETS.

### C-ENV-05-1 COFFERDAM CROSSING DESIGN CRITERIA

DIVERSION. BYPASS FLOW. BYPASS FLOW TO SAFELY CONVEY THE 2-YEAR, 24-HOUR PEAK FLOW. COFFERDAM SHALL BE ALLOWED TO OVERTOP ANY EVENTS GREATER THAN THE 2-YEAR, 24-HOUR PEAK ELEVATION. THE ORDINARY HIGH-WATER (OHW) MARK (OHWM) CAN BE USED AS AN INDICATOR OF THE 2-YEAR, 24-HOUR PEAK ELEVATION. THE TERM "LOW-FLOW CONDITIONS" REFERS TO FLOW AT OR BELOW THE OHMM. COFFERDAM SHALL NOT CAUSE A SIGNIFICANT WATER LEVEL DIFFERENCE UPSTREAM OR DOWNSTREAM OF THE PROJECT STE. STREAM VECICITY BELOW THE COFFERDAM SHALL BE AT A RATE EQUAL TO EXISTING PREINSTALLATION FLOW CONDITIONS ABOVE THE COFFERDAM.

MATERIALS - COFFERDAMS SHALL BE CONSTRUCTED OF NON-ERODIBLE MATERIALS SUCH AS STONE, GOSYNTHETICS, OR OTHER PRODUCTS AS APPROVED BY THE ENGINEER. ENSURE THE COFFERDAM MATERIALS ARE FREE OF POTENTIAL POLLUTANTS SUCH AS SOIL, SILT, SAND, CLAY, GREASE, OR OIL. USE NON-TOXIC AND NONHAZARDOUS SUBSTANCES TO ASSEMBLE OR MAINTAIN COFFERDAMS. ENSURE ANY MATERIAL USED TO MINIMIZE SEEPAGE UNDERREATH DIVERSION STRUCTURES IS NON-TOXIC, NON-HAZARDOUS, AND SCLOSE TO NEUTRAL PH (7) AS POSSIBLE. ACCEPTABLE

FILLED BAGS/TUBES, PLASTIC WRAPPED AGGREGATE/RIPRAP.

SCHEDULING - AVOID OR MINIMIZE IMPACTS, SCHEDULE CONSTRUCTION DURING SEASONAL OR TEMPORARY PERIODS OF LOW- OR NO-FLOW CONDITIONS.

VELOCITY DISSIPATOR - RIPRAP OR SANDBAG-LINED DISCHARGE "PLUNGE POOL" SHALL BE NON-EROSIVE AT THE DISCHARGE PIPE VELOCITY.

COFFERDAM MATERIALS SHALL INCLUDE SANDBAGS, SAND TOTES, COLLAPSIBLE FABRIC MEMBRANE DAMS, WATER

## C-ENV-05-2 COFFERDAM CROSSING TYPE

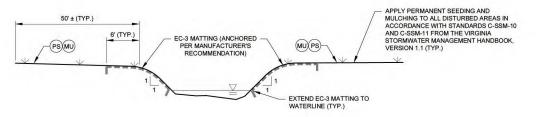
STONE & IMPERMEABLE BARRIER - TO INSTALL A STONE IMPERMEABLE BARRIER COFFERDAM, FIRST PLACE THE IMPERMEABLE BARRIER ON THE BOTTOM OF THE WATER FEATURE. EXTEND THE BARRIER OUT PAST THE EDGE OF THE FUTURE COFFERDAM AT A SUFFICIENT LENGTH SO THAT IT CAN BE PULLED BACK OVER THE RIPRAP AFTER IT HAS BEEN INSTALLED. THIS WILL CREATE A SEAMLESS BARRIER ON THE WATER SIDE WITH THE OPENING SEAM ON THE WORK AREA SIDE. AFTER THE BARRIER IS PULLED OVER THE RIPRAP, IT WILL LIKELY BE NECESSARY TO HOLD THE IMPERMEABLE BARRIER IN PLACE WITH RIPRAP OR SANDBAGS. VDOT AGGREGATE #1 OR CLASS AI RIPRAP CAN BE USED TO CONSTRUCT THE COFFERDAM TO WITHSTAND ANTICIPATED DESIGN FLOWS.

#### C-ENV-05-2 COFFERDAM CONSTRUCTION SPECIFICATIONS

- BEFORE COMMENCEMENT OF INSTREAM ACTIVITIES, PROPERLY INSTALL ALL APPROPRIATE SOIL EROSION AND SEDIMENT CONTROL MEASURES.
- DURING DISTURBANCE OR REMOVAL OF VEGETATION, DO NOT EXCEED THE MINIMUM NECESSARY TO COMPLETE OPERATIONS.
- 3. DO NOT ALLOW CONSTRUCTION EQUIPMENT TO ENTER STANDING OR FLOWING WATER. IF EQUIPMENT ACCESS TO THE WORK AREA THROUGH WATER IS NECESSARY, CONSTRUCT A NON-ERODIBLE CAUSEWAY.
- 4. FOR COFFERDAMS USED IN LINEAR WATER FEATURES, PROVIDE FOR EMERGENCY OVERFLOW AT THE CENTER OF THE COFFERDAM TO PREVENT EROSION ALONG THE BANKS. ENSURE THE OVERFLOW SYSTEM INCLUDES AN ENERGY DISSIPATING SURFACE AND DOES NOT CONTRIBUTE TO OR CAUSE EROSION OF THE STREAM.
- 5. FOLLOWING COFFERDAM INSTALLATION, COMPLETELY DEWATER THE WORK AREA TO WORK UNDER DRY CONDITIONS. BEFORE COMPLETE DEWATERING OF THE WORK AREA, REMOVE TRAPPED FISH AND OTHER AQUATIC WILDLIFE, AND RELOCATE TO THE WATER BODY DOWNSTREAM OF THE LOWER COFFERDAM. PUMPING OF WATER MAY BE REQUIRED THROUGHOUT CONSTRUCTION TO MAINTAIN DRY CONDITIONS. USE THE CRITERIA IN DEWATERING STRUCTURE (BMP C-SCM-10) TO ACHIEVE DRY CONDITIONS.
- 6. MAINTAIN THE EXTERIORS OF VEHICLES AND EQUIPMENT THAT WILL BE WITHIN THE COFFERED AREA FREE OF GREASE, OIL, FUEL, AND RESIDUES. POSITION STATIONARY EQUIPMENT, SUCH AS MOTORS AND PUMPS LOCATED WITHIN THE WORK AREA OR ADJACENT TO A WATER BODY, OVER DRIP PANS OR OTHER CONFINEMENT AREA. STORE ALL EQUIPMENT OUTSIDE OF THE FLOODPLAIN WHEN NOT IN USE TO AVOID INUNDATION DURING A HIGH-WATER EVENT.
- 7. FILTER WATER PUMPED FROM THE WORK AREA TO ENSURE THAT THE DISCHARGE RESULTS IN NO VISIBLE INCREASE IN SUSPENDED SOLIDS OR TURBIDITY IN THE WATER SURROUNDING THE WORK AREA. ENSURE THE QUALITY OF DISCHARGE MEETS ALL APPLICABLE LOCAL, STATE, OR FEDERAL REGULATIONS, WHICHEVER IS MOST RESTRICTIVE. ENSURE THAT THE FILTERED WATER IS DISCHARGED IN A MANNER THAT DOES NOT CAUSE EROSION. PROVIDE STABILIZATION MEASURES TO THE FLOW PATH FROM THE POINT OF DISCHARGE TO THE RECEIVING WATER BODY AS REQUIRED. METHODS FOR CLEANING WATER DISCHARGED FROM THE WORK AREA INCLUDE DEWATERING STRUCTURE (BMP C-SCM-10) AND TEMPORARY SEDIMENT TRAP (BMP C-SCM-11).
- DISCHARGE ALL WATER PUMPED FROM OR DIVERTED AROUND THE WORK AREA ON AN ENERGY DISSIPATING SURFACE SO AS NOT CONTRIBUTE TO OR CAUSE EROSION OF THE STREAM.
- 9. REMOVE ALL TEMPORARY MATERIALS AFTER THE COMPLETION OF CONSTRUCTION. BEFORE COFFERDAM REMOVAL, STABILIZE THE WORK AREA WITH APPROPRIATE VEGETATIVE AND/OR STRUCTURAL PRACTICES, IN ACCORDANCE WITH PLAN DETAILS AND SPECIFICATIONS, THAT ARE STABLE ENOUGH TO ACCEPT FLOWS AS DETERMINED BY THE CERTIFIED PLAN REVIEWER.
- REMOVE THE DOWNSTREAM COFFERDAM FIRST, FOLLOWED IMMEDIATELY BY THE REMOVAL OF THE UPSTREAM COFFERDAM.
- 11. STABILIZE DISTURBED AREAS WITH THE APPROPRIATE VEGETATION OR OTHER STABILIZATION MEASURES UPON THE COMPLETION OF WORK OR DURING PERIODS OF INACTIVITY. REMOVE EXCAVATED MATERIAL OR SPOILS RESULTING FROM THE ACTIVITY FROM THE COFFERED AREA AS SOON AS POSSIBLE AND DO NOT ALLOW THE EXCAVATED MATERIAL OR SPOILS TO REMAIN OVERNIGHT. RESTORE WATERWAYS ONLY WITH ORIGINAL CHANNEL BOTTOM SUBSTRATE MATERIALS FOLLOWING THE COMPLETION OF WORK.

# C-ENV-05-2 COFFERDAM OPERATIONS AND MAINTENANCE

- BECAUSE THE POTENTIAL FOR WASHOUT IS HIGH, MONITOR THE COFFERDAM DAILY AND DO NOT LEAVE THE COFFERDAM UNATTENDED FOR LONGER THAN 24 HOURS.
- 2. OBSERVE WEATHER REPORTS DAILY. IF A STORM EVENT IS EXPECTED, STABILIZE THE SITE AS APPROPRIATE. MAKE ALL REPAIRS IMMEDIATELY TO PREVENT FURTHER DAMAGE TO THE INSTALLATION.
- 3. REGULARLY INSPECT COFFERDAMS FOR LEAKS OR OTHER DEFICIENCIES. REMOVE SANDBAGS USED WITHIN THE COFFERDAM, IF APPLICABLE, BY HAND TO PREVENT BREAKAGE.
- 4. RETURN ALL DISTURBED SOIL WITHIN THE COFFERED AREA TO ORIGINAL CONDITION WITH ALL POSSIBLE EFFORTS MADE TO RETAIN THE EXISTING SOIL PROFILE BEFORE REMOVAL OF THE DAMS.
- RESEED THE SIDESLOPES, STABILIZE WITH AN APPROPRIATE EROSION CONTROL BLANKET, AND RESTORE THE SUBSTRATE TO PRE-CONSTRUCTION CONDITIONS. INITIATE STABILIZATION OF ALL REMAINING DISTURBED AREAS IMMEDIATELY FOLLOWING THE REMOVAL OF THE COFFERDAMS. DO NOT LEAVE AREAS ADJACENT TO WATER FEATURES DISTURBED OVERNIGHT.



STREAM RESTORATION DETAIL

NOT TO SC

Schnabel ENGINEERING JEB Stuart Parkway, Suite Glen Allen, VA 23059 Phone: 804-649-7035 Fax: 804-264-3244 schnabel-eng-com TEMPORARY STREAM CROSSING IMPACT PLAN SKIPPERS BIOSOLIDS COMPOSTING FACILITY SKIPPERS, VIRGINIA SYNAGRO PROJECT: 24560007.090 DATE: 04/25/25 ESC-4

SHEET

# STONE & IMPERMEABLE BARRIER COFFERDAM CROSSING DETAIL

C-ENV-05-4

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