

**APPENDIX D – DESIGN DRAWINGS**

# NON-TIME-CRITICAL REMOVAL ACTION TP-1, TP-2 AND TP-3 CLOSURE DESIGN

## ELIZABETH MINE STRAFFORD, VERMONT



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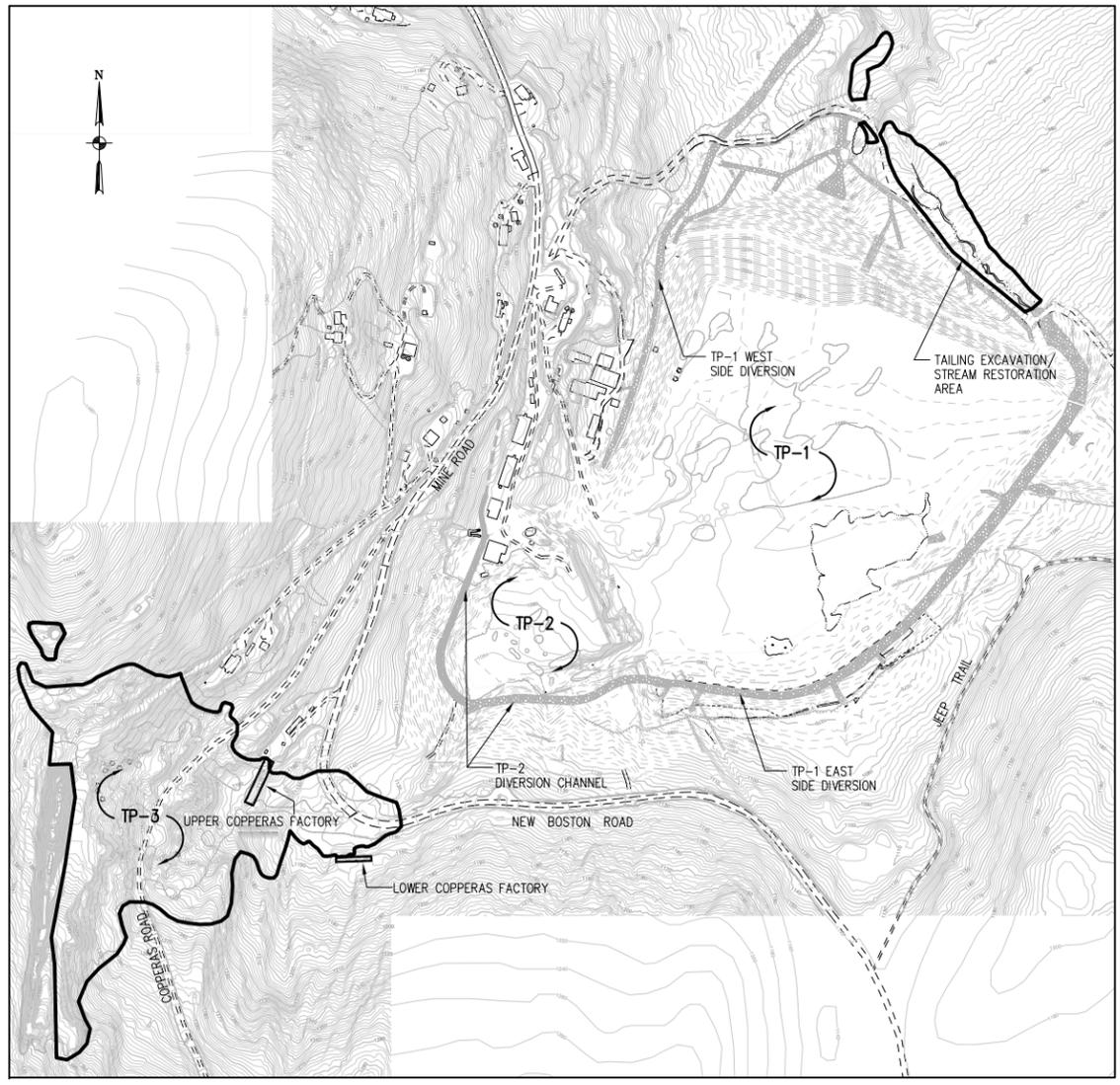
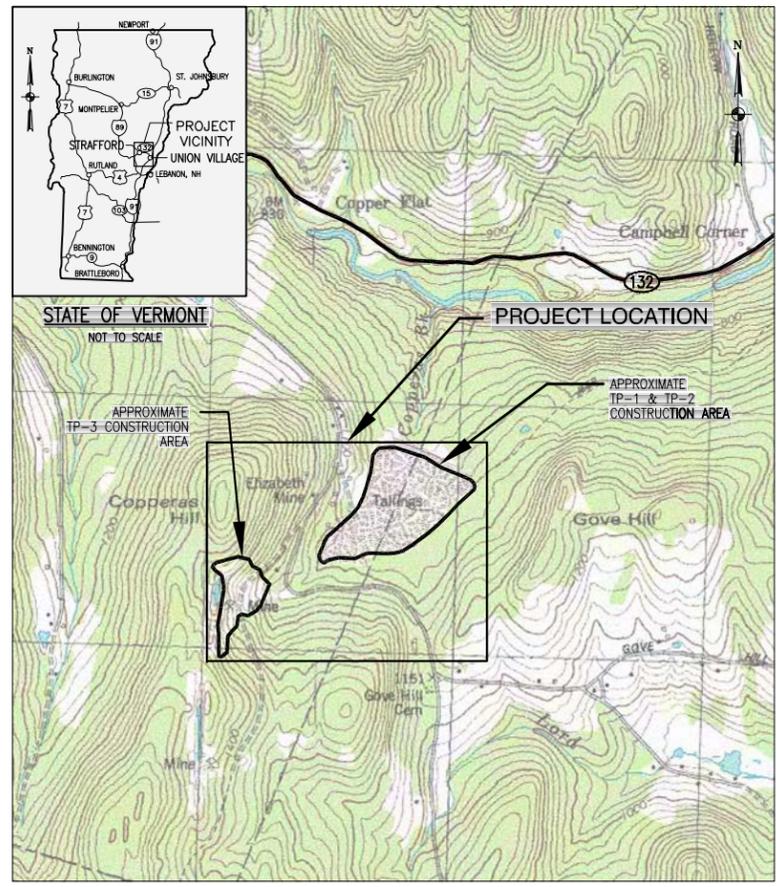
Mark	Description	Date	Appr.
1	WORK IN PROGRESS	9/7/07	
2	USACE REVIEW	04/08	
3	DRAFT FINAL	04/08	
4	FINAL USACE SUBMISSION	03/09	

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	Plot scale: AS SHOWN	

COVER SHEET

Sheet  
reference  
number:  
**C-001**

Sheet 1 of 19

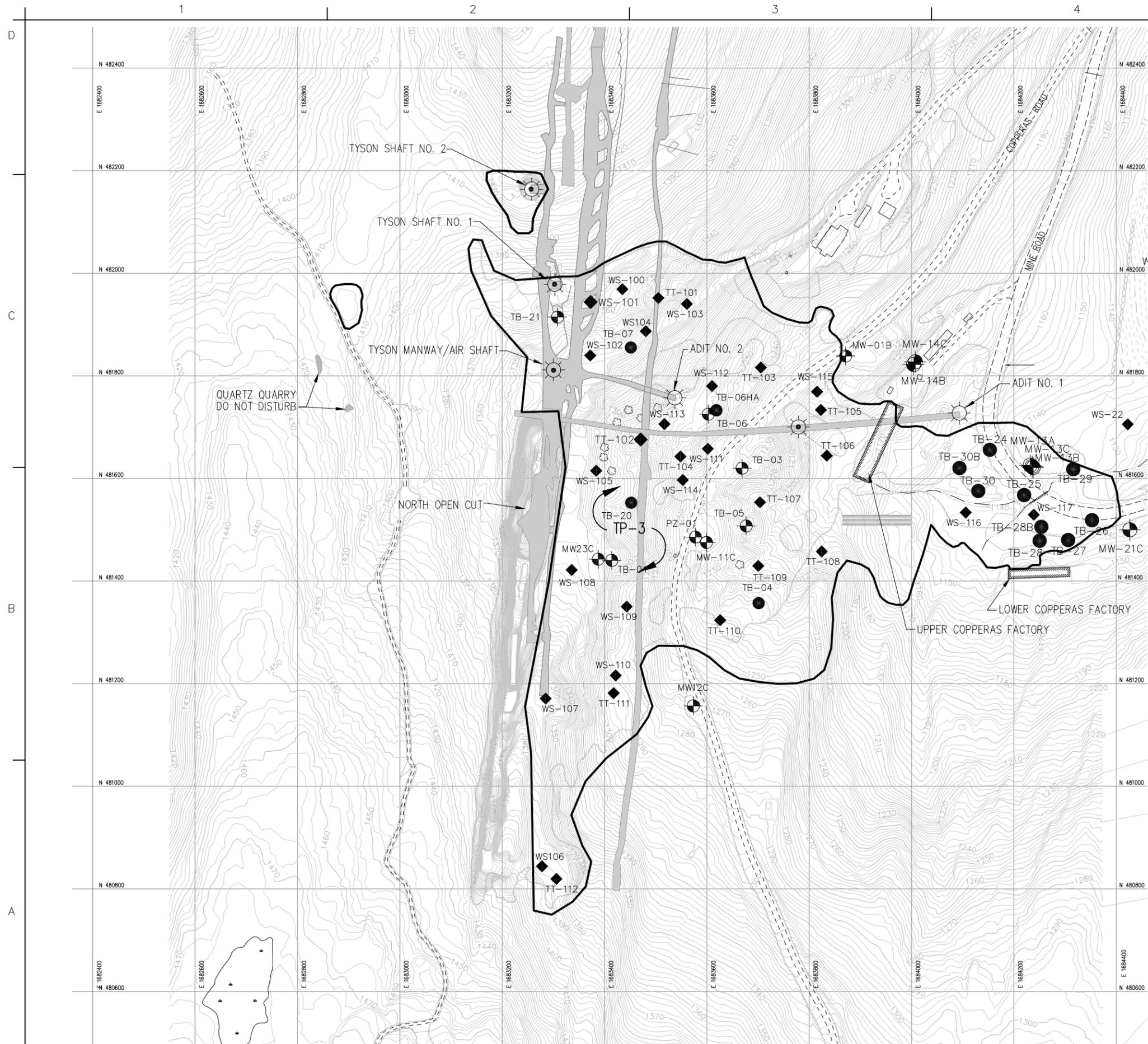


DRAWING INDEX	
SHEET NO.	DESCRIPTION
C-001	COVER SHEET
C-002	TP-1 AND TP-2 EXISTING CONDITIONS
C-003	TP-3 EXISTING CONDITIONS
C-004	UPPER AND LOWER COPPERAS FACTORY REMEDIATION PLAN
C-005	LOWER TP-3 EXCAVATION PLAN
C-006	LOWER TP-3 RESTORATION PLAN
C-007	UPPER TP-3 EXCAVATION PLAN
C-008	UPPER TP-3 RESTORATION PLAN
C-009	TP-3 ROAD DETAILS
C-010	TP-3 TEMPORARY SEDIMENT BASIN DESIGN AND DETAILS
C-011	TP-1 AND TP-2 SUBGRADE PLAN
C-012	TP-1 AND TP-2 COVER SYSTEM DRAINAGE PLAN
C-013	TP-1 AND TP-2 FINAL GRADING PLAN
C-014	TP-1 AND TP-2 SURFACE DRAINAGE AND MISCELLANEOUS DETAILS
C-015	TP-1 AND TP-2 TYPICAL DETAILS
C-016	TP-1 AND TP-2 TYPICAL DETAILS
C-017	TAILING EXCAVATION AND STREAM RESTORATION PLAN
C-018	STREAM RESTORATION TYPICAL DETAILS
C-019	TP-1 AND TP-2 TYPICAL SYSTEM ROAD PLAN

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### GENERAL NOTES

1. BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE). SOLID LINES INDICATE AERIAL PHOTOGRAPHIC TOPOGRAPHY. DASHED LINES ARE GROUND SURVEYED TOPOGRAPHY.
2. HORIZONTAL COORDINATE SYSTEM PRESENTED ON DRAWINGS IS BASED ON VERMONT STATE PLANE COORDINATES.
3. EXISTING CONDITIONS AS OF DECEMBER 2006.
4. TEST PITS AND MONITORING WELL LOCATIONS ARE SHOWN FOR INFORMATIONAL PURPOSES. ASSOCIATED BORING AND TEST PIT LOGS HAVE BEEN ISSUED AS PART OF PRIOR SUBMISSIONS TO USACE.
5. LOCATION AND ORIENTATION OF UNDERGROUND MINE WORKINGS SHOWN ON THIS PLAN ARE BASED ON VERMONT COPPER CO., INC. MAPS AND DRAWINGS DATED AUGUST 1949 AND ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY. LOCATION AND EXTENT SHOWN ON PLAN MAY NOT REFLECT ACTUAL CONDITIONS.
6. ADIT AND SHAFT LOCATIONS ARE APPROXIMATE AND BASED UPON HISTORICAL DRAWINGS. CONTRACTOR MUST USE CARE WHEN WORKING AROUND ADITS AND SHAFTS TO PREVENT POTENTIAL COLLAPSES.

### LEGEND

- TP-3 EXCAVATION LIMIT
- APPROXIMATE LOCATION OF UNDERGROUND MINE WORKINGS
- TEST PIT
- MONITORING WELL
- TEST BORING
- STONE WALL
- COPPERAS BROOK
- TREELINE
- ADIT PORTAL, LOCATION APPROXIMATE
- SHAFT/MANWAY, LOCATION APPROXIMATE
- UNPAVED ROAD
- FORMER OR EXISTING BUILDING
- HISTORIC FOUNDATION

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04/01/09	1

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AUG	AUG/GJB	JCC/DNH	URS CORPORATION

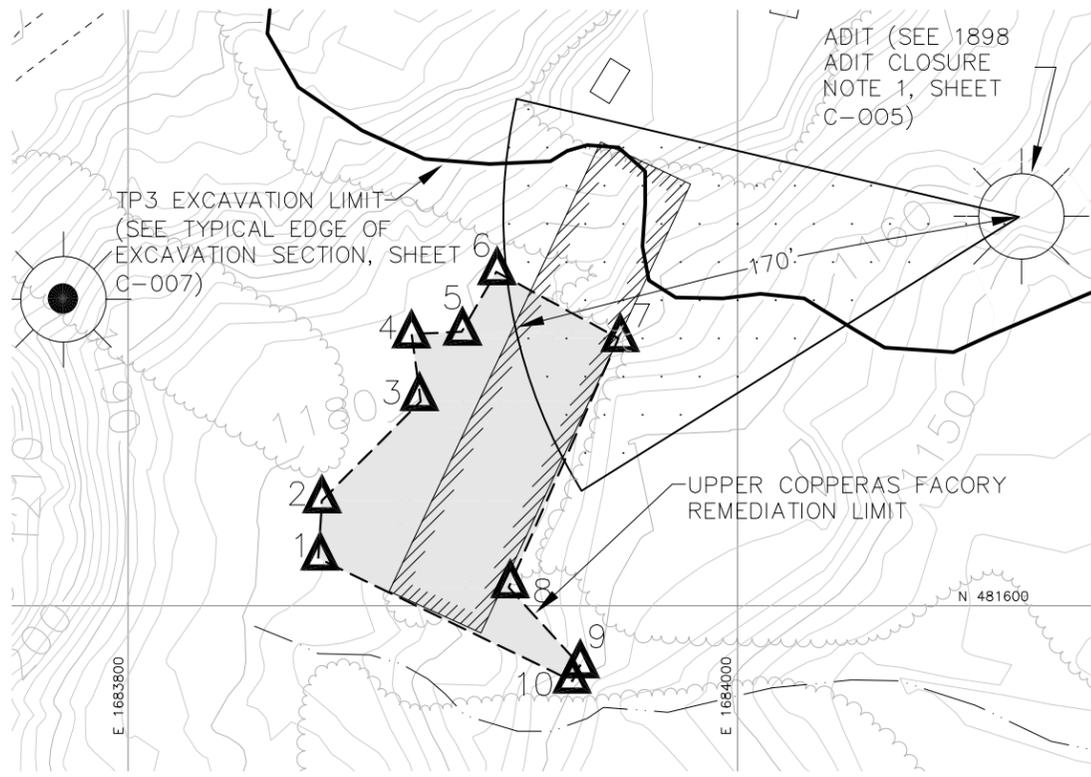
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TP-3 EXISTING CONDITIONS
   
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**C-003**
  
 Sheet 3 of 19

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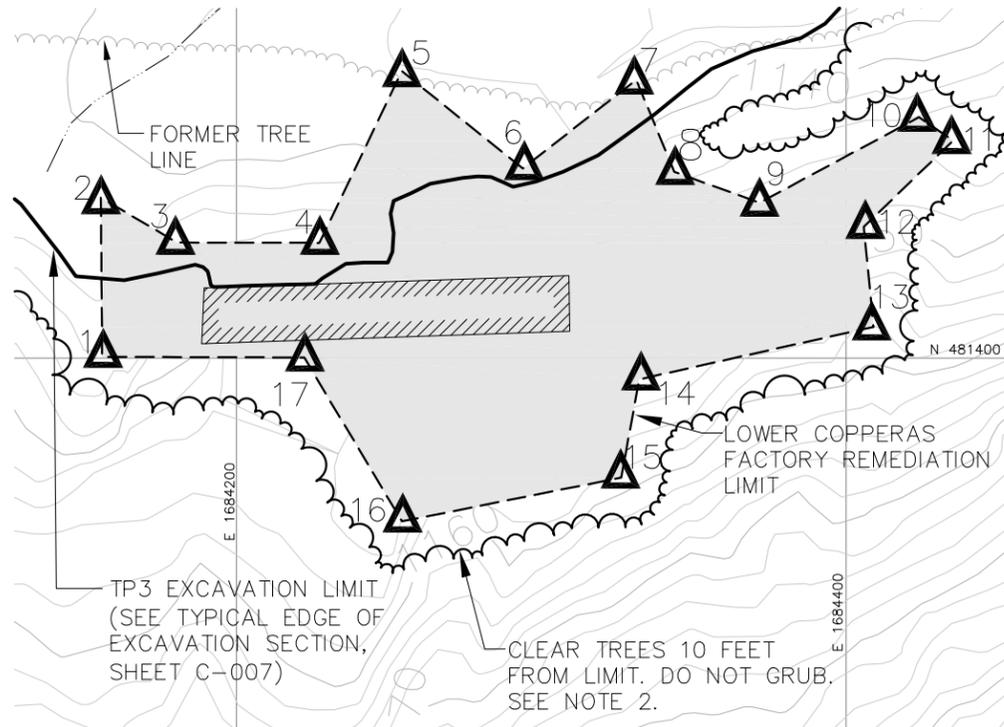
**NOTES**

1. THE FINAL REMEDIATION LIMITS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.
2. ALL VEGETATION INCLUDING BRUSH, TREES AND TREE STUMPS WITHIN THE REMEDIATION AREA SHALL BE CUT AS CLOSE TO THE GROUND AS PRACTICAL. ALL CUT VEGETATION AND WOODY DEBRIS ON THE GROUND SURFACE SHALL BE REMOVED AND DISPOSED OF AS DIRECTED BY THE ENGINEER. ALL REMOVED MATERIAL SHALL BE ESSENTIALLY FREE OF SOIL.
3. FOR HISTORIC PRESERVATION REASONS, THE CONTRACTOR SHALL TAKE ALL MEASURES PRACTICAL TO PREVENT DAMAGE TO THE EXISTING WALLS OF THE COPPERAS FACTORIES. EXCAVATION ADJACENT TO EXISTING STONE WALLS SHALL BE PERFORMED BY HAND OR BY SMALL BACKHOE AND DONE IN A MANNER THAT MINIMIZES THE RISK OF WALL COLLAPSE. SHORING, PROPPING OR OTHERWISE SUPPORTING THE WALL MAY BE REQUIRED AS DETERMINED BY THE ENGINEER. EXCAVATION AND BACKFILLING ADJACENT TO WALLS SHALL BE DONE UNDER THE DIRECT SUPERVISION OF THE ENGINEER.
4. REMEDIATION OF LEAD-IMPACTED SOIL FROM THE COPPERAS FACTORY AREAS TO BE ACHIEVED EITHER THROUGH IN-PLACE COVER OR THROUGH EXCAVATION AND RELOCATION TO A DESIGNATED FILL AREA ON TP-1 OR TP-2, AS FOLLOWS OR AS DIRECTED BY THE ENGINEER:
  - a. FOR LEAD-IMPACTED SOIL CLOSED IN-PLACE WITHIN THE REMEDIATION AREA, ALL SOILS TO BE COVERED TO A DEPTH OF AT LEAST 2 FEET WITH 1-INCH STONE OR EQUIVALENT. PLACE AN 8-OUNCE NON-WOVEN GEOTEXTILE APPROXIMATELY 8 TO 12 INCHES BELOW THE STONE SURFACE TO ACT AS A BIO-BARRIER TO LIMIT VEGETATION GROWTH. THE STONE COVER IS TO BE GRADED TO DRAIN. THE STONE COVER WITHIN 5 FEET OF THE WALLS SHALL BE HAND PLACED.
  - b. ALL LEAD-IMPACTED SOIL EXCAVATED FROM THE COPPERAS FACTORIES SHALL BE TEMPORARILY STOCKPILED ON TP-1 OR TP-2, OR AT A SEPARATE LOCATION APPROVED BY THE ENGINEER. THE TEMPORARY STOCKPILE SHALL BE LINED AND COVERED IN A MANNER APPROVED BY THE ENGINEER TO ISOLATE THE MATERIAL AND TO MINIMIZE THE MIGRATION OF LEAD THROUGH RUNOFF OR INFILTRATION. THE STOCKPILE SHALL BE TESTED FOR HAZARDOUS CHARACTERISTICS IN ACCORDANCE WITH AN ENGINEER-APPROVED WORK PLAN AND CONFORMING TO STATE AND FEDERAL REGULATIONS, AS REQUIRED. IN THE EVENT THAT THE MATERIAL TO BE RELOCATED IS DETERMINED THROUGH TESTING TO BE HAZARDOUS WITH REGARD TO LEAD CONTENT, THE CONTRACTOR SHALL PERFORM ONSITE STABILIZATION USING EITHER PHYSICAL OR CHEMICAL STABILIZATION PROCESSES TO RENDER THE LEAD IMMOBILE USING A PROCEDURE APPROVED BY THE ENGINEER. FOLLOWING STABILIZATION (IF REQUIRED), THE MATERIAL SHALL BE RE-TESTED TO VERIFY EFFECTIVENESS OF THE TREATMENT PROCESS PRIOR TO PLACEMENT IN THE FILL AREA (SEE NOTE 4C). ALL WORK ASSOCIATED WITH THE STOCKPILING, STABILIZATION (IF REQUIRED) AND PLACEMENT SHALL BE PERFORMED IN ACCORDANCE WITH AN ENGINEER APPROVED WORK PLAN.
  - c. FOLLOWING STABILIZATION (SEE NOTE 4b) ALL LEAD-IMPACTED SOILS EXCAVATED FROM THE COPPERAS FACTORIES SHALL BE PLACED IN THE ENGINEER-APPROVED FILL AREA ON TP-1 OR TP-2. THE FILL AREA SHALL BE LOCATED BY THE ENGINEER AND SHALL GENERALLY CONFORM TO THE FOLLOWING REQUIREMENTS: FILL PLACEMENT SHALL BE CONTIGUOUS WITHIN A SINGLE DEFINED AREA; FILL PLACEMENT SHALL NOT BE ADJACENT TO THE DAM CREST; FILL PLACEMENT SHALL BE IN A FREE-DRAINING AREA LOCATED ABOVE THE WATER TABLE; FILL AREA SHALL BE GRADED TO DRAIN AND COVERED BY A TEMPORARY, INTERIM COVER CONSISTING OF A CONTINUOUS SHEET OF PVC, HDPE, OR EQUIVALENT MATERIAL OF ADEQUATE THICKNESS AND LONGEVITY FOR THE INTENDED INTERIM STOCKPILE PERIOD. THE COVER SHALL BE ADEQUATELY BALLASTED AND VENTED TO PREVENT MOVEMENT. THE DESIGN OF THE TEMPORARY COVER SHALL BE APPROVED BY THE ENGINEER PRIOR TO COMMENCING EXCAVATION OF LEAD-IMPACTED SOIL.
  - d. ALL DISTURBED AREAS WITHIN THE LIMIT OF REMEDIATION, INCLUDING COVERED AREAS DESCRIBED IN NOTE 4c ABOVE, SHALL BE BROUGHT TO A FINAL GRADE APPROXIMATELY EQUAL TO THE EXISTING PRE-REMEDIATION GROUND SURFACE, EXCEPT FOR COVERED AREAS WHERE MODIFICATIONS ARE NECESSARY TO ACHIEVE SURFACE DRAINAGE. FOR AREAS WHERE LEAD-IMPACTED SOILS ARE REMOVED, THE FINAL GRADE CAN BE ACHIEVED BY BACKFILLING WITH COMMON BORROW.
  - e. ANY REMEDIATION AREA WHICH EXTENDS INTO THE TP-3 EXCAVATION LIMIT WILL BE REMEDIATED THROUGH EXCAVATION AND RELOCATION METHODS ONLY; OR AS DIRECTED BY THE ENGINEER TO ACCOMMODATE TP-3 CLOSURE.
5. CONFIRMATORY SAMPLING AND ANALYSIS SHALL BE PERFORMED WITHIN THE REMEDIATION AREA IN ALL AREAS WHERE LEAD HAS BEEN EXCAVATED AND RELOCATED AT A MINIMUM FREQUENCY OF ONE SAMPLE PER 100 SQUARE FEET. CONFIRMATORY SAMPLING AND LEAD ANALYSIS SHALL ALSO BE PERFORMED ALONG THE PERIMETER OF THE REMEDIATED AREAS AT A MINIMUM SAMPLE FREQUENCY OF 1 SAMPLE PER 50 LINEAR FEET. SAMPLE COLLECTION AND TESTING SHALL FOLLOW STANDARD METHODS. AREAS LOCATED BEYOND THE EXTENT OF EITHER THE IN-PLACE COVER LAYER OR THE EXCAVATION AREAS WHICH ARE FOUND TO EXHIBIT LEAD LEVELS EXCEEDING 400 PARTS PER MILLION SHALL BE RELOCATED AND COVERED OR CLOSED-IN-PLACE AND THE NEW LIMIT RE-TESTED, AS DIRECTED BY THE ENGINEER.
6. THERE SHALL BE MINIMAL EXCAVATION AND DISTURBANCE OF THE GROUND OUTSIDE OF THE REMEDIATION AREA.
7. BOULDERS AND CUT STONES ESSENTIALLY FREE OF SOIL SHALL BE PLACED OUTSIDE THE REMEDIATION LIMIT DURING THE WORK AND MADE AVAILABLE FOR USE IN POST-REMEDIATION SURFACE LANDSCAPING, AS DIRECTED BY THE ENGINEER IN CONSULTATION WITH THE CULTURAL HISTORIAN.
8. REVEGETATION OF THE COPPERAS FACTORY SHALL FOLLOW RESTORATION REQUIREMENTS ASSOCIATED WITH THE LOWER TP-3 AREA. SEE SHEET C-006 FOR DETAILS.
9. CONTRACTOR SHALL SURVEY THE LIMITS OF THE LEAD-IMPACTED SOIL COVER AREAS AT COMPLETION OF WORK.
10. ALL WORK AT THE COPPERAS FACTORIES SHALL BE COORDINATED WITH USEPA, USACE, AND WITH THE CULTURAL ARCHAEOLOGIST.



**UPPER COPPERAS FACTORY  
REMEDIAL LIMIT COORDINATES**

NODE	NORTHING	EASTING
1	481615.5	1683862.4
2	481634.5	1683863.6
3	481666.9	1683896.0
4	481688.9	1683893.1
5	481689.8	1683909.4
6	481709.4	1683920.8
7	481687.5	1683960.9
8	481606.1	1683924.9
9	481580.5	1683948.3
10	481575.3	1683945.8



**LOWER COPPERAS FACTORY  
REMEDIAL LIMIT COORDINATES**

NODE	NORTHING	EASTING
1	481400.4	1684155.9
2	481452.5	1684155.5
3	481437.8	1684180.5
4	481437.7	1684227.2
5	481493.9	1684254.3
6	481462.1	1684293.9
7	481491.1	1684331.2
8	481460.9	1684343.7
9	481450.9	1684371.7
10	481478.8	1684423.9
11	481471.2	1684435.1
12	481442.9	1684405.9
13	481410.2	1684409.0
14	481393.1	1684332.2
15	481360.9	1684326.2
16	481346.6	1684254.3
17	481400.2	1684222.2

**LEGEND**

- HISTORIC FOUNDATION
- HEAVY EQUIPMENT AND TRUCKS EXCLUSION ZONE
- AREA OF LEAD IMPACTS REQUIRING REMEDIATION
- ADIT PORTAL LOCATION APPROXIMATE
- SHAFT LOCATION APPROXIMATE
- TP-3 EXCAVATION LIMIT
- COPPERAS BROOK/TRIBUTARY
- REMEDIATION LIMIT NODE
- FORMER OR EXISTING BUILDING

**GENERAL NOTES**

1. BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE).
2. HORIZONTAL COORDINATE SYSTEM PRESENTED ON DRAWINGS IS BASED ON VERMONT STATE PLANE COORDINATES.
3. EXISTING CONDITIONS AS OF DECEMBER 2006.
4. REMEDIATION LIMITS BASED ON DATA COLLECTED FROM 2003 THROUGH 2007.
5. ADIT AND SHAFT LOCATIONS ARE APPROXIMATE AND BASED UPON HISTORICAL DRAWINGS. CONTRACTOR MUST USE CARE WHEN WORKING AROUND ADITS AND SHAFTS TO PREVENT POTENTIAL COLLAPSES.

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Rev.	Date	Description
1	03/08	FINAL USACE SUBMISSION
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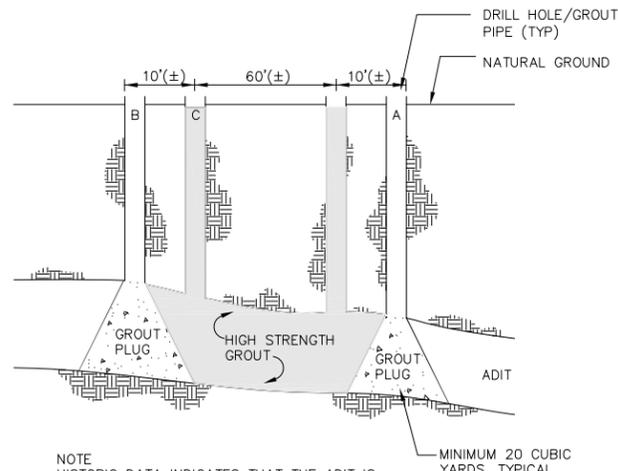
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UPPER AND LOWER COPPERAS  
FACTORY REMEDIATION PLAN  
Sheet reference number:  
**C-004**  
Sheet 4 of 19

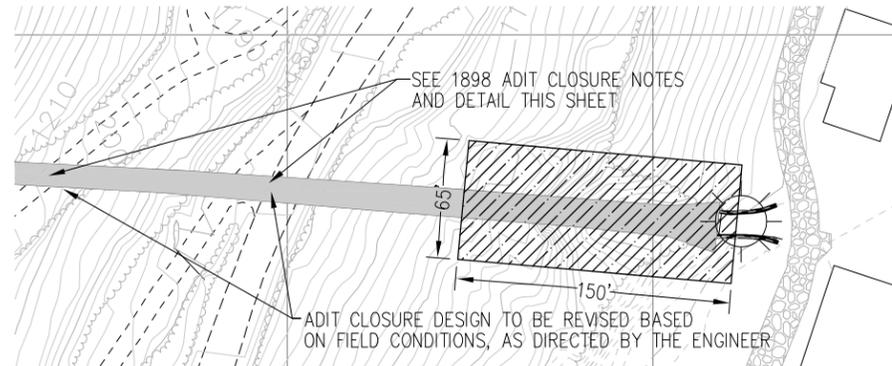
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### LOWER TP-3 EXCAVATION NOTES

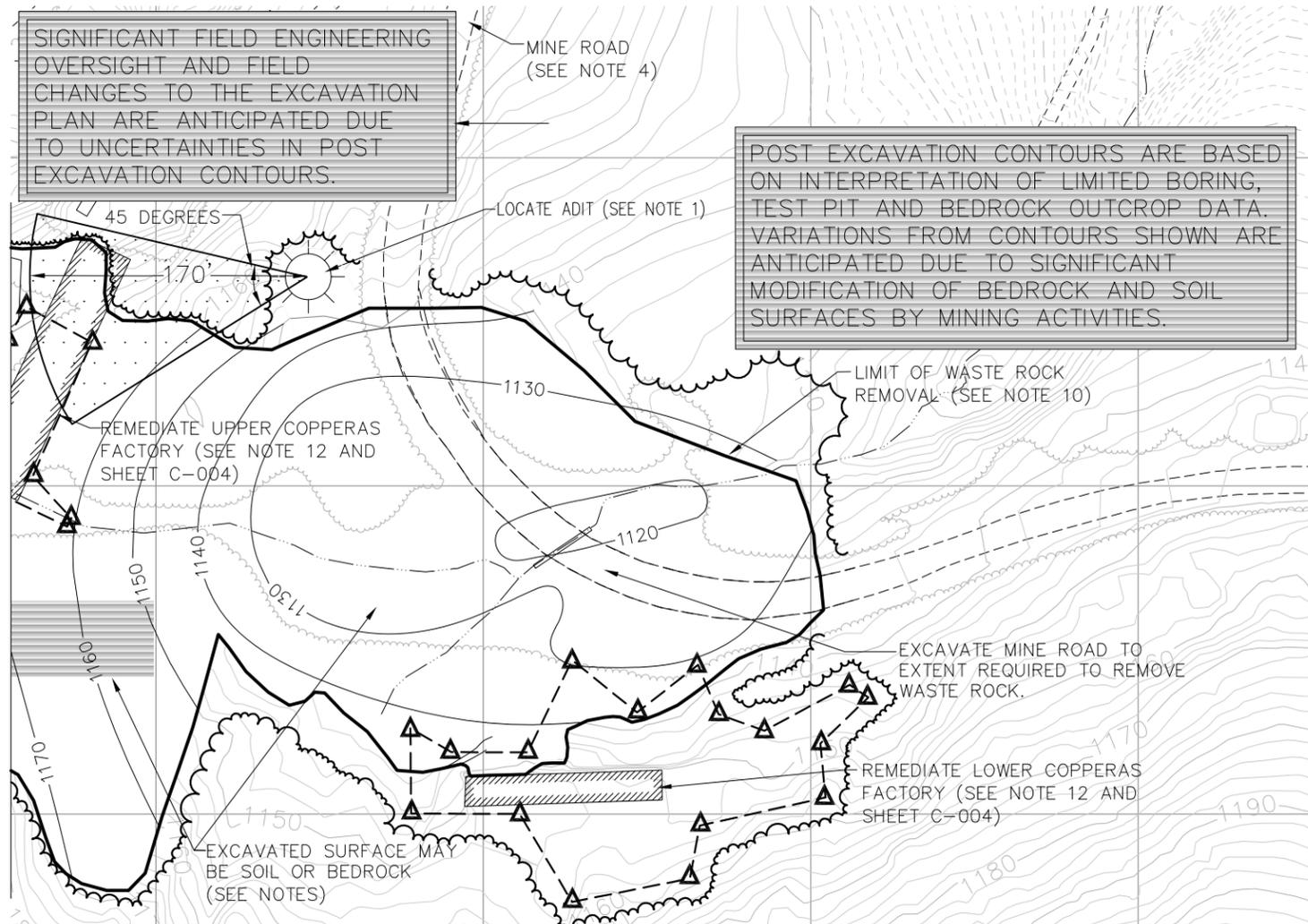
- LOCATE ADIT PORTAL BY BACKHOE EXCAVATOR AND EXPOSE ADIT IN ROCK. FINAL ADIT CLOSURE TO BE DETERMINED BY ENGINEER BASED ON PROJECT REQUIREMENTS.
- EXCAVATE WASTE ROCK TO BEDROCK OR NATURAL SOIL SURFACE. REMOVE ALL LOOSE WASTE ROCK AND ALTERED SOIL AS DIRECTED BY THE ENGINEER USING MECHANICAL (I.E., BACKHOE AND BULLDOZER) METHODS. PLACE EXCAVATED WASTE ROCK ON TP-1 IN A MANNER SUITABLE FOR COVERING. ALL EXCAVATED WASTE ROCK SHALL BE COVERED BY THE TP-1 COVER SYSTEM AT THE END OF EACH CONSTRUCTION SEASON.
- ALL EXCAVATION WORK SHALL BE COORDINATED WITH THE CULTURAL ARCHAEOLOGIST PER CONTRACTOR'S WORK PLAN. PROTECT ALL CULTURAL FEATURES LOCATED OUTSIDE OF LIMIT OF WASTE ROCK EXCAVATION FROM DAMAGE OR DISTURBANCE.
- MAINTAIN VEHICLE ACCESS VIA MINE ROAD AS REQUIRED BY ENGINEER.
- WASTE ROCK WILL INCLUDE MINED ORE, CAP ROCK, ROAST BED MATERIAL, TIMBER AND WOOD DEBRIS, OTHER WASTE MATERIAL, AND CLEARING AND GRUBBING DEBRIS FROM WITHIN THE EXCAVATION LIMITS.
- STOP WORK IMMEDIATELY IN THE VICINITY OF ANY UNMAPPED ADIT OR SHAFT THAT MAY BECOME EXPOSED DURING WORK. ENGINEER TO REVIEW CONDITIONS PRIOR TO RESTART OF WORK.
- PERFORM EXCAVATION WORK SO AS TO LIMIT EROSION OF WASTE ROCK INTO COPPERAS BROOK. PERFORM ALL WORK IN ACCORDANCE WITH APPROVED EROSION AND SEDIMENT CONTROL PLAN.
- DO NOT EXCAVATE UPPER TP-3 UNTIL LOWER TP-3 IS EXCAVATED AND TEMPORARY SEDIMENT BASIN AT LOWER TP-3 IS IN OPERATION.
- ABANDON AND REMOVE ALL EXISTING BEDROCK MONITORING WELLS, PIEZOMETERS AND CASINGS ABOVE POST EXCAVATION SURFACE AND DISPOSE OF AS DIRECTED BY THE ENGINEER.
- THE LIMIT OF WASTE ROCK REMOVAL IS APPROXIMATE. ACTUAL LIMIT WILL BE DETERMINED IN THE FIELD BY THE ENGINEER BASED ON OBSERVED CONDITIONS.
- PERFORM EXCAVATION ACTIVITIES IN A MANNER THAT DOES NOT DISTURB COPPERAS FACTORIES OR LEAD CONTAINMENT AREAS.
- REMEDiate THE UPPER AND LOWER COPPERAS FACTORIES PRIOR TO EXCAVATING TP-3.
- ADIT LOCATION IS APPROXIMATE AND BASED UPON HISTORICAL DRAWINGS. CONTRACTOR MUST USE CARE WHEN AROUND ADIT TO PREVENT POTENTIAL COLLAPSES.
- EQUIPMENT SETBACKS BASED ON VISUAL OBSERVATIONS FROM GROUND SURFACE. SUBSURFACE CONDITIONS MAY VARY AND SETBACKS ARE PROVIDED AS GENERAL GUIDANCE ONLY. CONTRACTOR RESPONSIBLE TO MAINTAIN SAFE OPERATING CONDITIONS. WORK TO BE PERFORMED AT CONTRACTOR'S RISK. WORK IN AND AROUND EXCLUSION ZONES TO BE PERFORMED BY CONTRACTOR EXPERIENCED IN SIMILAR WORK.



NOTE  
HISTORIC DATA INDICATES THAT THE ADIT IS APPROXIMATELY 6-FOOT WIDE BY 5-FOOT HIGH.  
**2** 1898 ADIT CLOSURE DETAIL  
005 NOT TO SCALE



1898 ADIT CLOSURE PLAN



LOWER TP-3 EXCAVATION PLAN

### 1898 ADIT CLOSURE NOTES

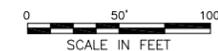
- PERFORM BORING AND ROCK CORING EXPLORATION TO CONFIRM ADIT DIMENSIONS, SUBSURFACE ADIT LOCATION AND PRESENCE OF CONTAINED POOL AS DIRECTED BY ENGINEER. BASED ON RESULTS OF EXPLORATION MODIFY CLOSURE DETAILS AS NECESSARY AND AS DIRECTED BY THE ENGINEER.
- ADIT TO BE ABANDONED BY PLACEMENT OF LOW AND HIGH STRENGTH GROUT OR SIMILAR MATERIAL FROM GROUND SURFACE.
  - GROUT PLUG SHALL BE A LOW SLUMP (LESS THAN 2-INCH) GROUT THAT WILL BE PUMPED FOR CONSTRUCTION OF BULKHEADS.
  - HIGH STRENGTH GROUT, 3000 PSI MIN. WITH 8 INCH SLUMP, SHALL BE PUMPED INTO THE UPSTREAM GROUT PIPE. HIGH STRENGTH GROUT WILL BE PUMPED CONTINUOUSLY UNTIL GROUT IS OBSERVED FLOWING FROM THE DOWNSTREAM PIPE.
  - GROUT SEQUENCE IS A, B, C
- SUBMIT PROPOSED GROUT AND HIGH STRENGTH GROUT MIX SPECIFICATIONS TO ENGINEER. SUBMIT PROPOSED WORK PLAN FOR ADIT CLOSURE TO ENGINEER FOR APPROVAL.
- ALL DRILL HOLES SHALL BE GROUTED AT COMPLETION OF CLOSURE.
- WORK TO BE PERFORMED BY CONTRACTOR EXPERIENCED IN SIMILAR WORK.

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### LEGEND

- HEAVY EQUIPMENT AND TRUCKS EXCLUSION ZONE
- 1240- ANTICIPATED POST EXCAVATION CONTOURS
- HISTORIC FOUNDATIONS
- ADIT PORTAL LOCATION APPROXIMATE
- CLEARING LIMIT
- ALL EQUIPMENT, TRUCKS AND PERSONNEL EXCLUSION ZONE
- APPROXIMATE LOCATION OF UNDERGROUND MINE WORKINGS
- TP-3-EXCAVATION LIMIT
- COPPERAS BROOK/TRIBUTARY
- REMEDIATION LIMIT NODE
- MINE ROAD
- FORMER OR EXISTING BUILDING



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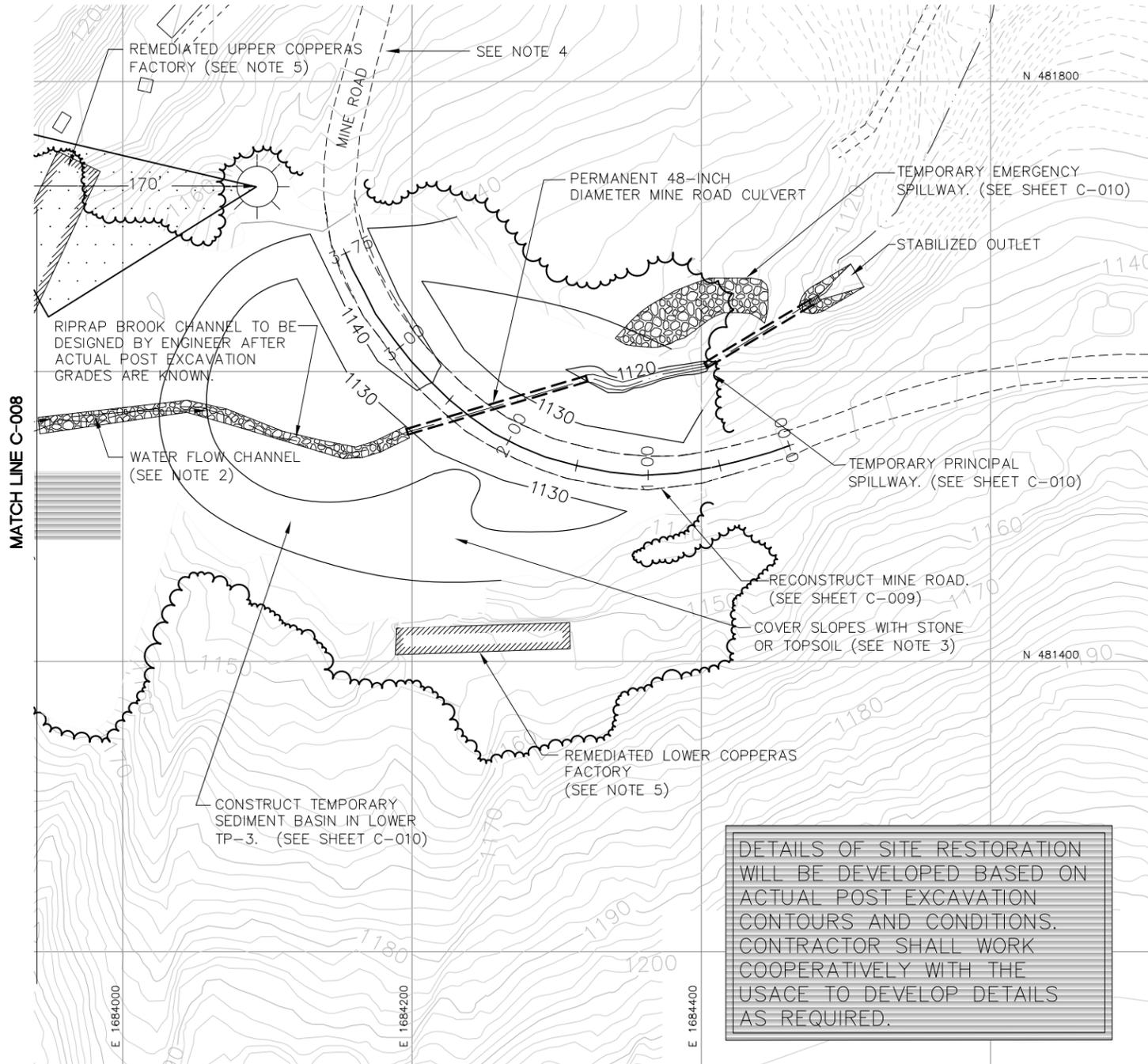
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LOWER TP-3  
EXCAVATION PLAN

Sheet reference number:  
**C-005**  
Sheet 5 of 19

**NOTES:**

- BEDROCK EXPOSED DURING THE EXCAVATION SHALL BE FREE OF EXCESS WASTE ROCK AND SOIL. AREAS OF LOOSE, UNSTABLE ROCK SHALL BE SCALED, EXCAVATED OR OTHERWISE MADE STABLE AS DIRECTED BY THE ENGINEER.
- ENGINEER TO CONFIRM THAT SURFACE WATER CHANNEL EXISTS ON BEDROCK OR OTHER MATERIAL SUITABLE TO CONVEY SURFACE WATER. MODIFY SURFACE BY EXCAVATION, AS NECESSARY. DIRECT SURFACE WATER AWAY FROM EDGE OF SOIL AREA.
- RESHAPE SOIL AREA TO PROMOTE POSITIVE DRAINAGE TOWARD SURFACE WATER FLOW CHANNEL. WHERE NEEDED, USE COMMON BORROW TO RESHAPE SLOPE. ALL SLOPES SHALL BE 2H:1V OR FLATTER. COVER SOIL AREA WITH A 10-INCH THICK LAYER OF 7-INCH MINUS RIPRAP AS A STONE COVER. PLACE GEOTEXTILE BENEATH STONE. SIGNIFICANT AREAS OF SOIL FLATTER THAN 4H:1V MAY BE COVERED WITH 6-INCHES OF TOPSOIL AND RESEDED.
- MANAGE MINE ROAD CLOSURE AND PUBLIC VEHICLE ACCESS VIA MINE ROAD AS REQUIRED BY ENGINEER.
- PERFORM EXCAVATION ACTIVITIES IN A MANNER THAT DOES NOT DISTURB THE COPPERAS FACTORIES OR LEAD CONTAINMENT AREA(S). SEE SHEET C-004.
- AS DIRECTED BY THE ENGINEER, AREAS OF SURFACE-EXPOSED WASTE ROCK LOCATED OUTSIDE OF WASTE LIMIT LEFT IN PLACE FOLLOWING EXCAVATION TO BE TREATED WITH 150 LBS. OF LIME PER 1,000 SQUARE FEET, COVERED WITH 12-INCHES OF TOPSOIL AND RESEDED.



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**LEGEND**

- HEAVY EQUIPMENT AND TRUCKS EXCLUSION ZONE
- ANTICIPATED FINAL SUBGRADE
- HISTORIC FOUNDATION
- ADIT PORTAL LOCATION APPROXIMATE
- PROPOSED CULVERT - LOCATION TO BE FIELD VERIFIED
- RIPRAP CHANNEL
- TP-3-EXCAVATION LIMIT
- COPPERAS BROOK/TRIBUTARY
- MINE ROAD
- FORMER OR EXISTING BUILDING
- TREE LINE



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Mark	Description	Date	Appr.
4	FINAL USACE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USACE REVIEW	04/07	
1	WORK IN PROGRESS	9/7/07	

Designed by: DWA/cjb	Date: 04/01/09	Rev.:
Drawn by: cjb	Design file no.:	
Reviewed by: JCC/ONH	Project #: 39459945	
Submitted by: URS CORPORATION	File name: NTCRA Closure.dwg	
	Plot date: AS SHOWN	
	Plot scale: AS SHOWN	

LOWER TP-3  
RESTORATION PLAN

Sheet reference number:  
**C-006**  
Sheet 6 of 19

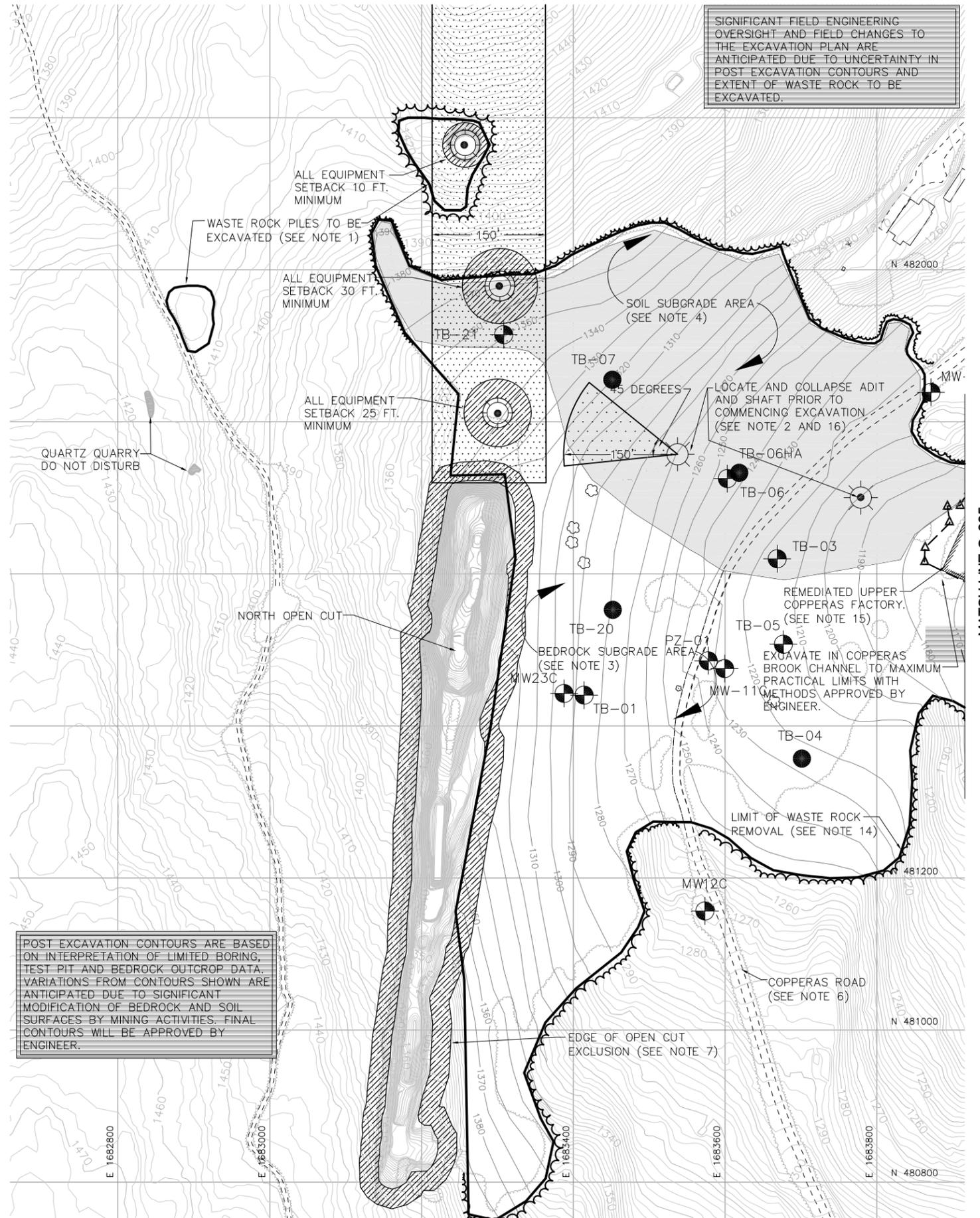


**NOTES**

- ISOLATED WASTE ROCK PILES TO BE EXCAVATED AND PLACED ON TP-1 WITH MINIMAL DISTURBANCE TO SURROUNDING AREA.
- CONTRACTOR SHALL LOCATE ADIT PORTAL AND SHAFT BY BACKHOE EXCAVATOR AND EXPOSE ADIT AND SHAFT IN ROCK. COLLAPSE ADIT AS DIRECTED BY THE ENGINEER. CLOSE OR SEAL SHAFT AS DIRECTED BY THE ENGINEER. FINAL EQUIPMENT SETBACKS TO BE DETERMINED BY ENGINEER BASED ON FIELD CONDITIONS.
- EXCAVATE WASTE ROCK TO BEDROCK SURFACE. REMOVE ALL LOOSE WASTE ROCK AND EXPOSED ORE AS PRACTICAL USING MECHANICAL, (I.E. BACKHOE AND BULLDOZER) METHODS. PLACE EXCAVATED WASTE ROCK ON TP-1 IN A MANNER SUITABLE FOR COVERING.
- EXCAVATE WASTE ROCK TO NATURAL SOIL SURFACE. REMOVE ALTERED SOIL AS DIRECTED BY ENGINEER. PLACE EXCAVATED WASTE ROCK ON TP-1 AS PER NOTE 3.
- ALL EXCAVATION WORK SHALL BE COORDINATED WITH THE CULTURAL ARCHAEOLOGIST PER CONTRACTOR'S WORK PLAN. PROTECT ALL CULTURAL FEATURES OUTSIDE OF LIMIT OF EXCAVATION FROM DAMAGE OR DISTURBANCE.
- MAINTAIN PUBLIC VEHICLE ACCESS VIA COPPERAS ROAD TO PROPERTIES TO THE SOUTH OF TP-3 AS REQUIRED BY ENGINEER.
- EXCAVATE WASTE ROCK TO THE MAXIMUM EXTENT PRACTICAL, WITHOUT PLACING EQUIPMENT WITHIN 25' OF EDGE OF OPEN CUT. IF NECESSARY, SHAPE AND GRADE WASTE ROCK SURFACE WITHIN THIS AREA TO DRAIN INTO THE OPEN CUT. WASTE ROCK MAY BE PUSHED INTO THE OPEN CUT AS PART OF RESHAPING, IF NEEDED.
- WASTE ROCK WILL INCLUDE MINED ORE, CAP ROCK, ROAST BED MATERIAL, TIMBER WOOD DEBRIS, AND OTHER WASTE MATERIAL AND CLEARING AND GRUBBING DEBRIS FROM WITHIN THE EXCAVATION LIMITS.
- STOP WORK IMMEDIATELY IN THE VICINITY OF ANY UNKNOWN ADIT OR SHAFT THAT MAY BECOME EXPOSED DURING WORK. ENGINEER TO REVIEW CONDITIONS PRIOR TO RESTART OF WORK.
- PERFORM EXCAVATION WORK SO AS TO LIMIT EROSION OF WASTE ROCK INTO COPPERAS BROOK. PERFORM ALL WORK IN ACCORDANCE WITH APPROVED EROSION AND SEDIMENT CONTROL PLAN.
- DO NOT EXCAVATE UPPER TP-3 UNTIL LOWER TP-3 IS EXCAVATED AND TEMPORARY SEDIMENT BASIN AT LOWER TP-3 IS IN OPERATION.
- PLACE CONSTRUCTION FENCING TO DELINEATE ALL EQUIPMENT AND PERSONNEL EXCLUSION ZONES PRIOR TO COMMENCING WORK.
- REMOVE ALL EXISTING MONITORING WELLS AND CASINGS ABOVE POST EXCAVATION SURFACE AND DISPOSE OF AS DIRECTED BY THE ENGINEER.
- THE LIMIT OF WASTE ROCK REMOVAL IS APPROXIMATE. ACTUAL LIMIT WILL BE DETERMINED IN THE FIELD BASED ON OBSERVED CONDITIONS BY THE ENGINEER.
- REMEDiate UPPER COPPERAS FACTORY PRIOR TO EXCAVATING TP-3. SEE SHEET C-004.
- ADIT AND SHAFT LOCATIONS ARE APPROXIMATE AND BASED UPON HISTORICAL DRAWINGS. CONTRACTOR MUST USE CARE WHEN AROUND ADITS AND SHAFTS TO PREVENT POTENTIAL COLLAPSES.
- EQUIPMENT SETBACKS BASED ON VISUAL OBSERVATIONS FROM GROUND SURFACE. SUBSURFACE CONDITIONS MAY VARY AND SETBACKS ARE PROVIDED AS GENERAL GUIDANCE ONLY. CONTRACTOR RESPONSIBLE TO MAINTAIN SAFE OPERATING CONDITIONS. WORK TO BE PERFORMED AT CONTRACTOR'S RISK. WORK IN AND AROUND EXCLUSION ZONES TO BE PERFORMED BY CONTRACTOR EXPERIENCED IN SIMILAR WORK.

POST EXCAVATION CONTOURS ARE BASED ON INTERPRETATION OF LIMITED BORING, TEST PIT AND BEDROCK OUTCROP DATA. VARIATIONS FROM CONTOURS SHOWN ARE ANTICIPATED DUE TO SIGNIFICANT MODIFICATION OF BEDROCK AND SOIL SURFACES BY MINING ACTIVITIES. FINAL CONTOURS WILL BE APPROVED BY ENGINEER.

SIGNIFICANT FIELD ENGINEERING OVERSIGHT AND FIELD CHANGES TO THE EXCAVATION PLAN ARE ANTICIPATED DUE TO UNCERTAINTY IN POST EXCAVATION CONTOURS AND EXTENT OF WASTE ROCK TO BE EXCAVATED.

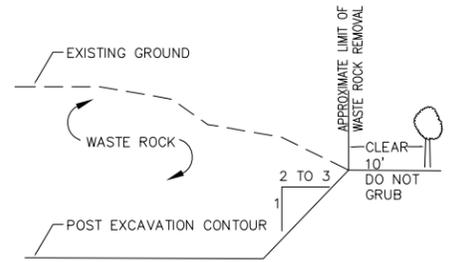


**GENERAL NOTES**

- BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE).
- HORIZONTAL COORDINATE SYSTEM PRESENTED ON DRAWINGS IS BASED ON VERMONT STATE PLANE COORDINATES.
- EXISTING CONDITIONS AS OF DECEMBER 2006.
- REMEDiation LIMITS BASED ON DATA COLLECTED FROM 2003 THROUGH 2007.
- ADIT AND SHAFT LOCATIONS ARE APPROXIMATE AND BASED UPON HISTORICAL DRAWINGS. CONTRACTOR MUST USE CARE WHEN WORKING AROUND ADITS AND SHAFTS TO PREVENT POTENTIAL COLLAPSES.

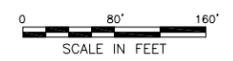
**LEGEND**

- HEAVY EQUIPMENT AND TRUCKS EXCLUSION ZONE
- ALL EQUIPMENT, TRUCKS AND PERSONNEL EXCLUSION ZONE
- SOIL SUBGRADE ANTICIPATED
- ANTICIPATED POST EXCAVATION CONTOURS
- HISTORIC FOUNDATION
- ADIT PORTAL LOCATION APPROXIMATE
- SHAFT/MANWAY LOCATION APPROXIMATE
- CLEARING LIMIT
- EXCAVATION LIMIT
- MONITORING WELL
- SOIL BORING
- REMEDiation LIMIT NODE
- FORMER OR EXISTING BUILDING



**TYPICAL EDGE OF EXCAVATION DETAIL**

- NOT TO SCALE
- THE LIMIT OF EXCAVATION MAY VARY BECAUSE OF UNKNOWN DEPTH OF WASTE ROCK AND SUBGRADE TYPE. SINCE FINAL POST EXCAVATION CONTOURS CAN NOT BE ESTABLISHED, FINAL GRADES AND EXCAVATION LIMITS WILL BE DETERMINED IN THE FIELD AT TIME OF EXCAVATION.



MATCH LINE C-005

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Work	Description	Date	Appr.
1	WORK IN PROGRESS	9/7/07	
2	USACE REVIEW	04/08	
3	DRAFT FINAL	03/08	
4	FINAL USACE SUBMISSION	03/08	

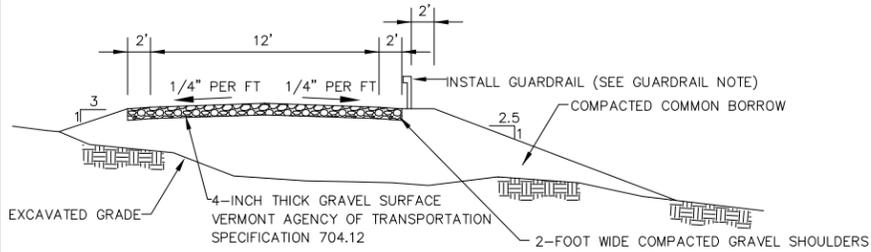
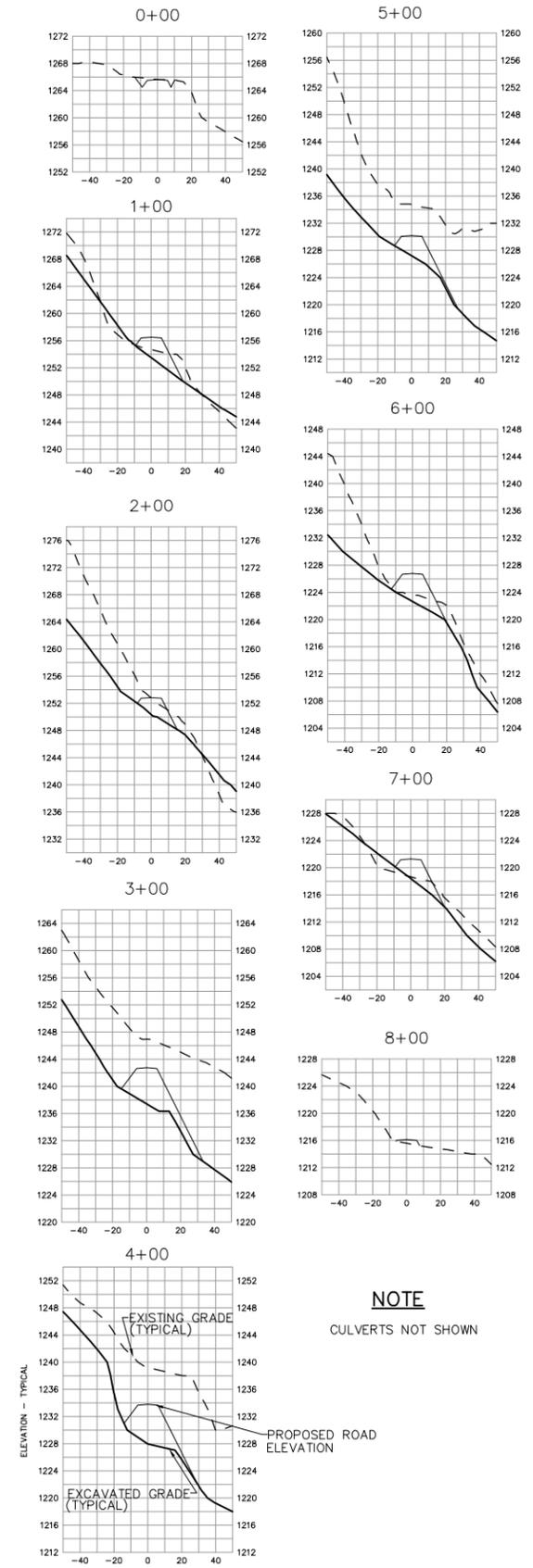
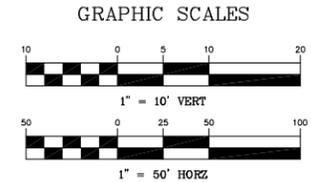
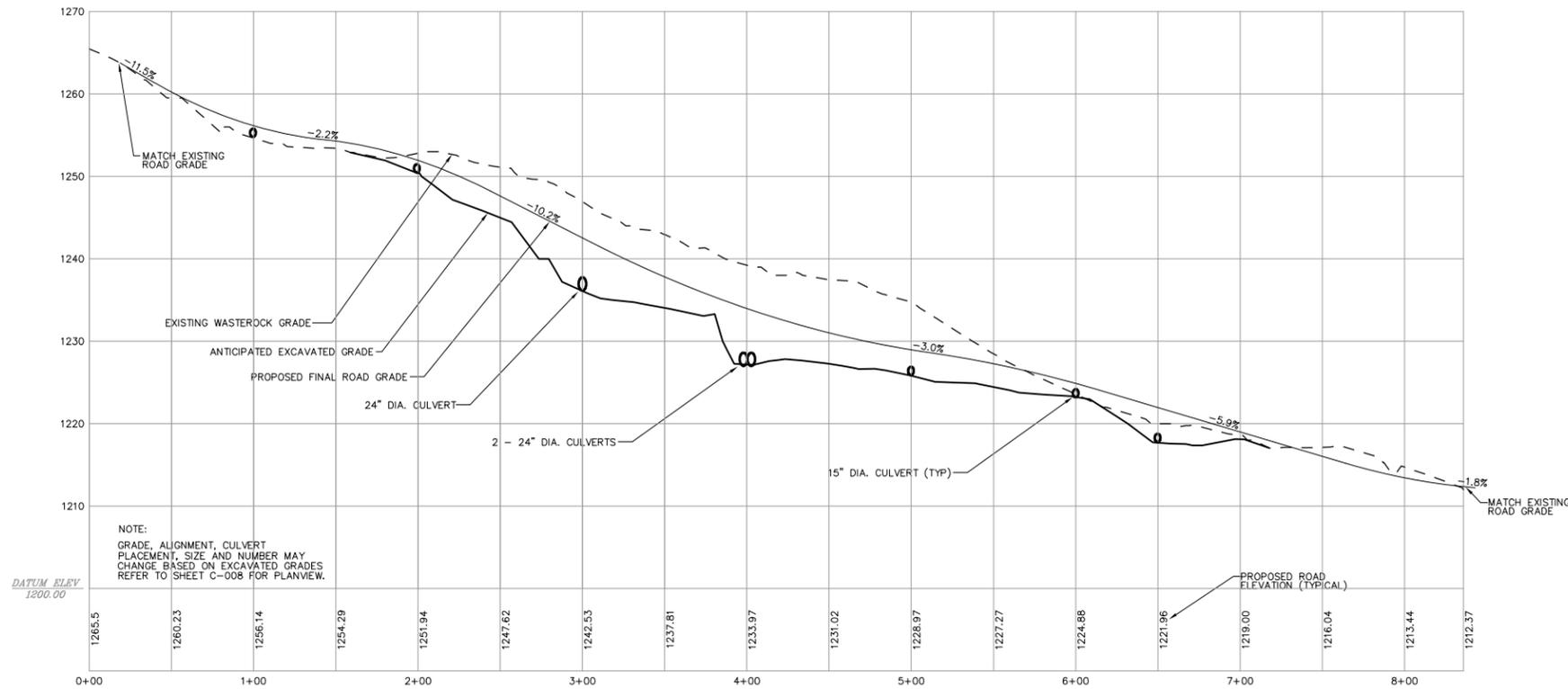
Designed by:	DWA/gjb	Rev.:	1
Drawn by:	gjb	Date:	04/01/09
Checked by:	DWA	Design file no.:	
Reviewed by:	JCC/DNH	Project #:	39459945
Submitted by:	URS CORPORATION	File name/NTCRA Closure.dwg	
		Plot scale:	AS SHOWN

UPPER TP-3  
EXCAVATION PLAN

Sheet reference number:  
**C-007**  
Sheet 7 of 19

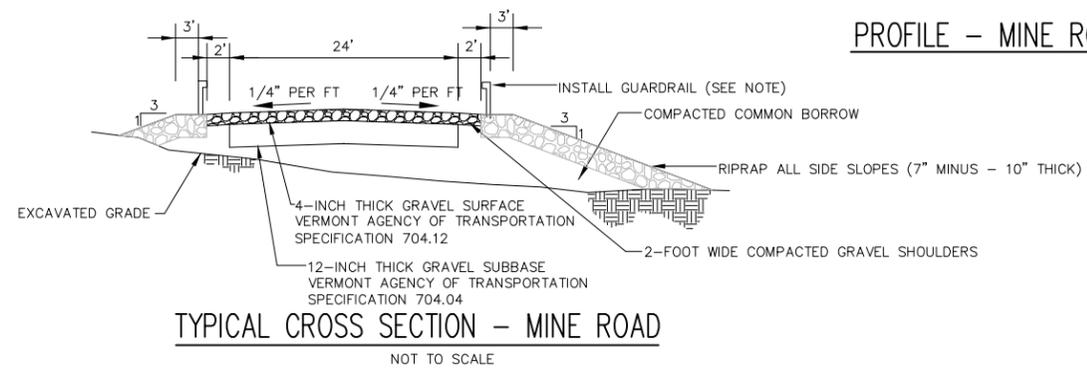
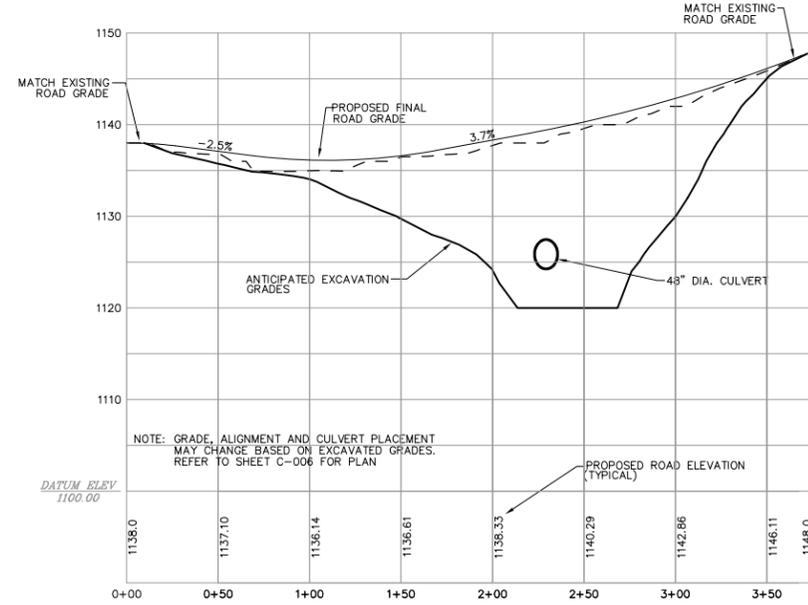


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**GUARDRAIL NOTE**

TYPE AND EXTENT OF GUARDRAILS TO BE DETERMINED BY CONTACTOR AND APPROVED BY ENGINEER. THE GUARDRAILS AND END TREATMENTS SHALL BE DESIGNED IN ACCORDANCE WITH AASHTO "ROADSIDE DESIGN GUIDE" CURRENT EDITION. MATERIALS USED IN THE GUARDRAILS SHALL CONFORM TO VERMONT AGENCY OF TRANSPORTATION SPECIFICATION 728.



**GENERAL NOTES**

1. BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE).
2. HORIZONTAL COORDINATE SYSTEM PRESENTED ON DRAWINGS IS BASED ON VERMONT STATE PLANE COORDINATES.
3. EXISTING CONDITIONS AS OF DECEMBER 2006.

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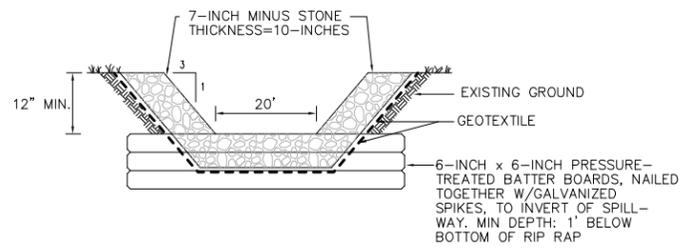
Rev.	Date	Description
1	03/08	FINAL USACE SUBMISSION
2	04/08	DRAFT FINAL
3	04/08	USACE REVIEW
4	03/09	WORK IN PROGRESS
5	07/07	JCC
6	07/07	JCC

Designed by:	DWA/cjb	Checked by:	DWA
Drawn by:	cjb	Reviewed by:	JCC/ONH
Date:	04/01/09	Submitted by:	URS CORPORATION
Design file no.:		File name:	Overturn-Batter.dwg
Project #:	39459945	Plot date:	AS SHOWN
Plot scale:			

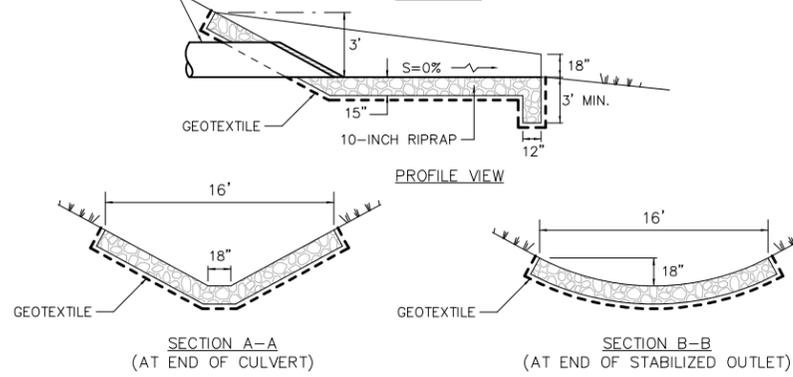
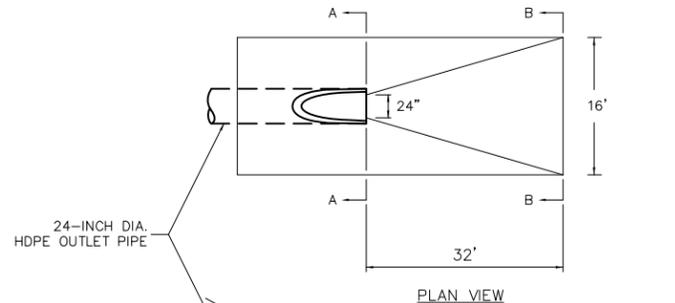
TP-3 ROAD DETAILS

Sheet reference number:  
**C-009**

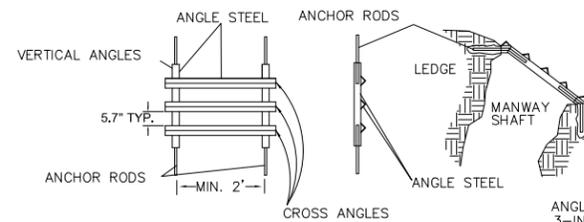
Sheet 9 of 19



1 TYPICAL TEMPORARY/EMERGENCY SPILLWAY SECTION  
010 NOT TO SCALE



4 STABILIZED OUTLET  
010 NOT TO SCALE

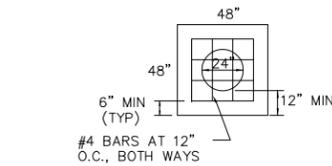
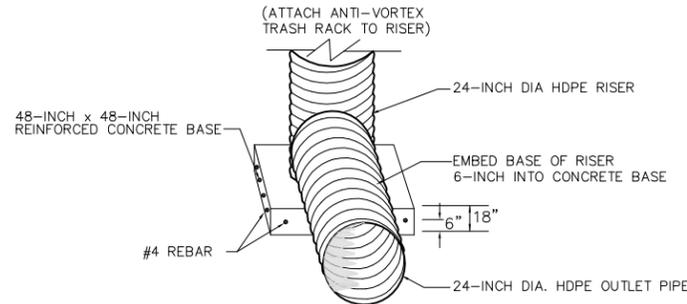
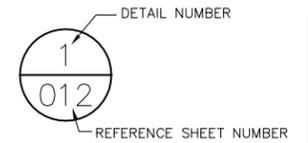


5 MANWAY GRATING  
008 NOT TO SCALE

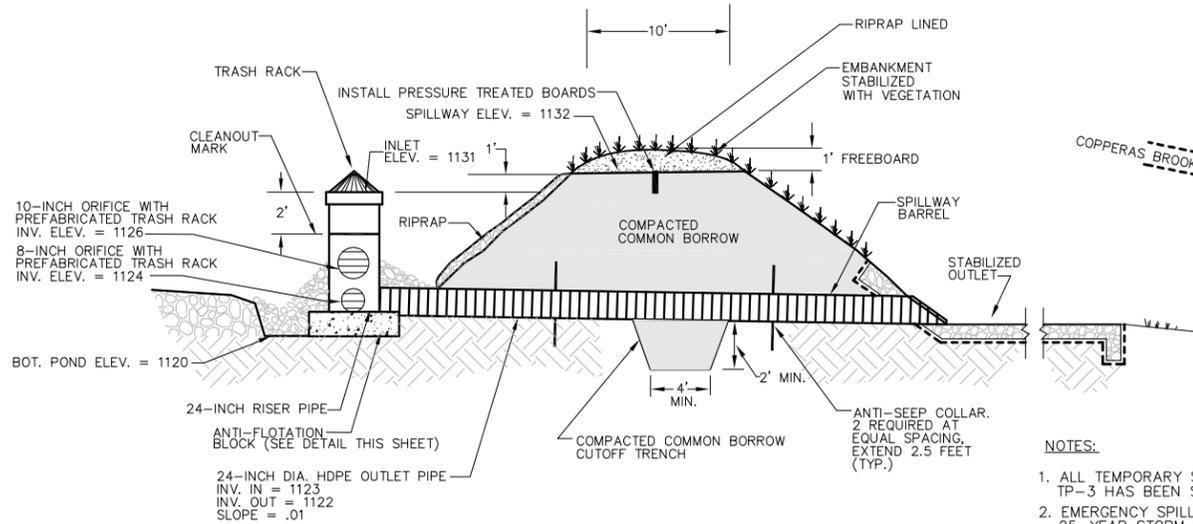
ANGLE STEEL: STAINLESS, TYPE 304  
3-INCH WIDTH, 1/4-INCH THICK  
ANCHOR RODS: STAINLESS, TYPE 304  
1-INCH DIAMETER

- NOTES:
1. ACTUAL DESIGN AND CONSTRUCTION OF GRATE MAY VARY FROM PLAN DIMENSIONS BASED ON FIELD CONDITIONS FOLLOWING EXCAVATION. APPROVAL FROM ENGINEER IS REQUIRED PRIOR TO INSTALLATION.
  2. SPACING BETWEEN CROSS ANGLES SHALL BE 5.7-INCH EDGE TO EDGE.
  3. EXTEND CROSS ANGLES TO ROCK SURFACE, BEND AS NEEDED.
  4. ADD ADDITIONAL CROSS ANGLES IF NEEDED TO MAINTAIN REQUIRED SPACING.
  5. EXTEND VERTICAL ANGLES TO ROCK SURFACE, BEND AS NEEDED.
  6. BEND ANCHOR RODS AS NEEDED TO GROUT INTO ROCK. DRILL AND PLACE ANCHOR RODS 12-INCH INTO COMPETENT ROCK.
  7. WELD ALL COMPONENTS.

LEGEND

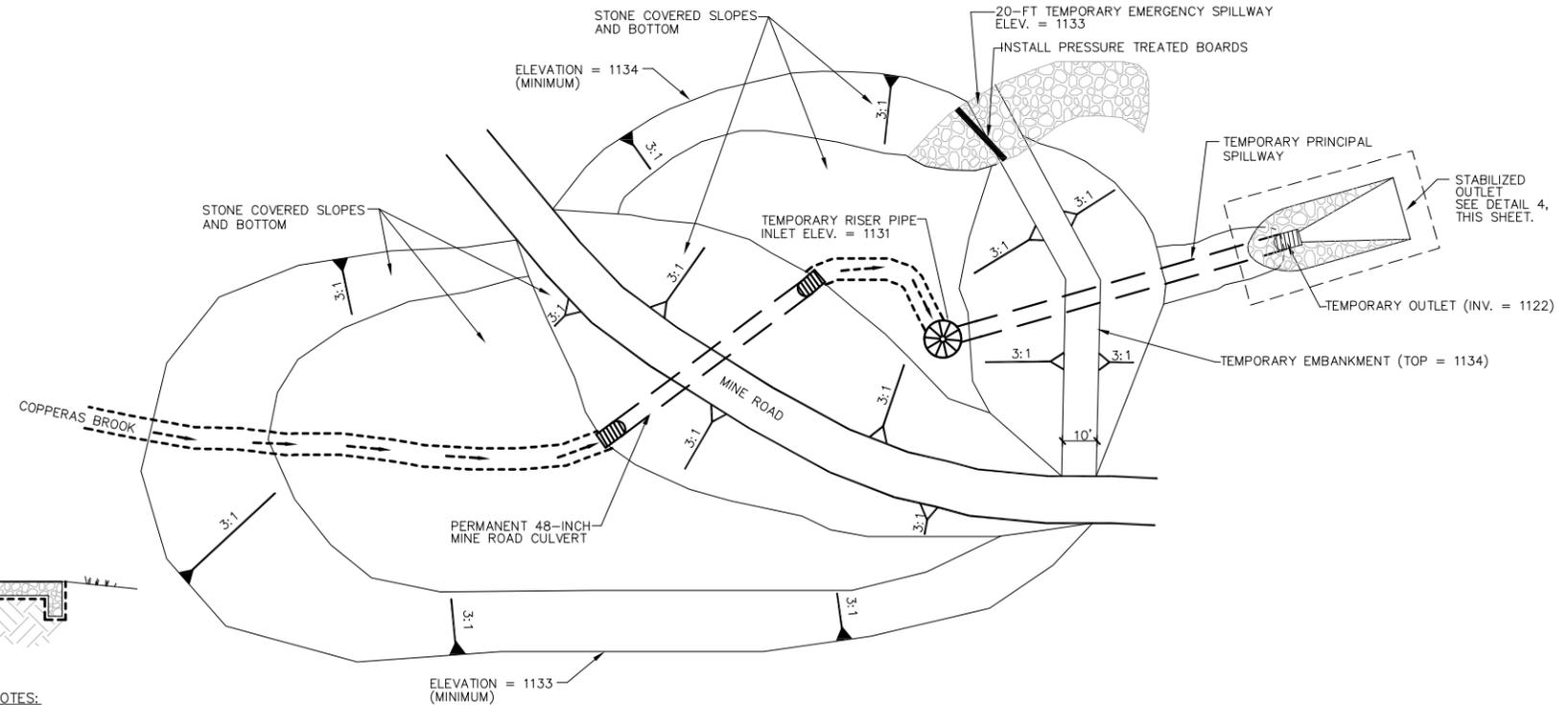


2 ANTI-FLOTATION BLOCK DETAIL  
010 NOT TO SCALE



3 SECTION THROUGH TEMPORARY PRINCIPAL SPILLWAY  
006 NOT TO SCALE

- NOTES:
1. ALL TEMPORARY STRUCTURES SHALL BE REMOVED AFTER TP-3 HAS BEEN STABILIZED.
  2. EMERGENCY SPILLWAY CAPACITY DESIGNED FOR 25-YEAR STORM FLOW (INCLUDING RIPRAP APRON).
  3. POND CAPACITY DESIGNED FOR 25 YEAR STORM BEFORE ACTIVATING EMERGENCY SPILLWAY.
  4. ALL CULVERTS, RISERS AND APPURTANCES SHALL BE AS MANUFACTURED BY HANCO, INC. OR EQUIVALENT.
  5. ACTUAL SIDE SLOPES OF SEDIMENT BASIN MAY VARY FROM 3H:1V DEPENDING ON FIELD CONDITIONS AND AS APPROVED BY THE ENGINEER. REFER TO PLAN VIEW ON SHEET C-006.



6 TEMPORARY SEDIMENT BASIN PLAN  
006 NOT TO SCALE

Rev.	Date	Description
1	04/01/09	WORK IN PROGRESS
2	04/08/09	USACE REVIEW
3	04/08/09	DRAFT FINAL
4	03/09/09	FINAL USACE SUBMISSION

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DWA/cjb	DWA	39459945	Elizabeth-Basin.dwg	AS SHOWN

TP-3 TEMPORARY SEDIMENT BASIN DESIGN AND DETAILS

**NOTES**

- REFER TO SHEETS C-015 AND C-016 FOR TYPICAL COVER SYSTEM DETAILS.
- REFER TO SHEET C-014 FOR TYPICAL SURFACE DRAINAGE SECTIONS AND MISCELLANEOUS DETAILS.
- STRIP GRASS COVER AND TOPSOIL ON TP-1 SLOPES. CLEAR AND GRUB AREAS OF TP-1 AND TP-2 AS NECESSARY AND AS DIRECTED BY ENGINEER.
- BREAK DOWN ANY CONCRETE OR OTHER DEBRIS STOCKPILED ON TP-1 TO PIECES NO LARGER THAN 2 FEET IN LARGEST DIMENSION.
- TAKE ALL PRACTICAL MEASURES TO PROTECT EXISTING BUILDINGS AND OTHER HISTORIC MINE INFRASTRUCTURE ADJACENT TO TP-1 AND TP-2 FROM DAMAGE.
- SEE TECHNICAL SPECIFICATION 02200 FOR ADDITIONAL INFORMATION ON FILL PLACEMENT.
- TAKE ALL PRACTICAL MEASURES TO PROTECT MONITORING WELLS DESIGNATED BY THE ENGINEER.
- FILL MATERIAL USED TO CREATE SUBGRADE WITHIN LIMIT OF COVER SHALL CONSIST OF WASTE ROCK FROM TP-3, TAILING EXCAVATED FROM AREA ADJACENT TO COPPERAS BROOK BELOW TP-1, TAILING PREVIOUSLY EXCAVATED FROM TP-2, TAILING GENERATED FROM REGRADING OF TP-1 AND TP-2, WASTE ROCK FILL EXCAVATED FROM AREA ADJACENT TO TP-2, TOPSOIL FROM SLOPES OF TP-1 (SEE NOTE 3), AND OTHER MATERIAL AS DESIGNATED BY THE ENGINEER. USE OF CLEAN COMMON BORROW AS FILL SHALL BE MINIMIZED.
- PLACE AND COMPACT FILL TO CREATE A RELATIVELY UNIFORMLY DENSE FILL. PLACE MATERIAL TO MINIMIZE NESTING OF COBBLES AND BOULDERS, LARGE MASSES OF WOOD AND OTHER DEBRIS.
- MANAGE PLACEMENT TO MINIMIZE COBBLES, BOULDERS, LARGE WOOD PIECES, AND DEBRIS IN THE UPPER 12-INCHES OF FILL BELOW THE GEOMEMBRANE BASE LAYER.
- THE TOP 6-INCHES (MINIMUM) OF THE SUBGRADE SHALL BE A GEOMEMBRANE BASE LAYER CONSISTING OF UNDISTURBED TAILING, TAILING FILL OR IMPORTED SILTY SAND TO SAND. THE BASE LAYER SHALL CONTAIN NO STONES GREATER THAN 1-INCH.
- ALL FILL PLACED OUTSIDE OF THE LIMIT OF COVER SHALL CONSIST OF CLEAN COMMON BORROW, FREE OF WASTE ROCK, TAILING, LARGE WOOD PIECES AND OTHER DEBRIS.
- ALL FILL PLACED ON REGRADED OR STRIPPED TAILING SURFACES SHALL BE COVERED BENEATH THE GEOMEMBRANE CAP AT THE END OF EACH CONSTRUCTION SEASON.
- ABANDON OR RAISE MONITORING WELLS ON TP-1 AND TP-2 THAT ARE DESIGNATED BY THE ENGINEER. ABANDONMENT METHODS SHALL BE APPROVED BY THE ENGINEER. SEE SHEET C-014 FOR DETAIL OF MONITORING WELL RAISING.
- TAILING AND WASTE ROCK IDENTIFIED OUTSIDE LIMIT OF COVER WILL BE EXCAVATED AND RELOCATED ONTO TP-1 AS DIRECTED BY THE ENGINEER.
- AS DIRECTED BY THE ENGINEER, AREAS OF WASTE ROCK LOCATED OUTSIDE OF WASTE LIMIT LEFT IN PLACE TO BE TREATED WITH 150 LBS. OF LIME PER 1,000 SQUARE FEET, COVERED WITH 12-INCHES OF TOPSOIL AND RESEDED.

**GENERAL NOTES**

- BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE).
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- EXISTING CONDITIONS AS OF DECEMBER 2006.



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Work	Description	Date	Appr.
1	WORK IN PROGRESS	9/7/07	
2	USACE REVIEW	04/08	
3	DRAFT FINAL	03/09	
4	FINAL USACE SUBMISSION	03/09	

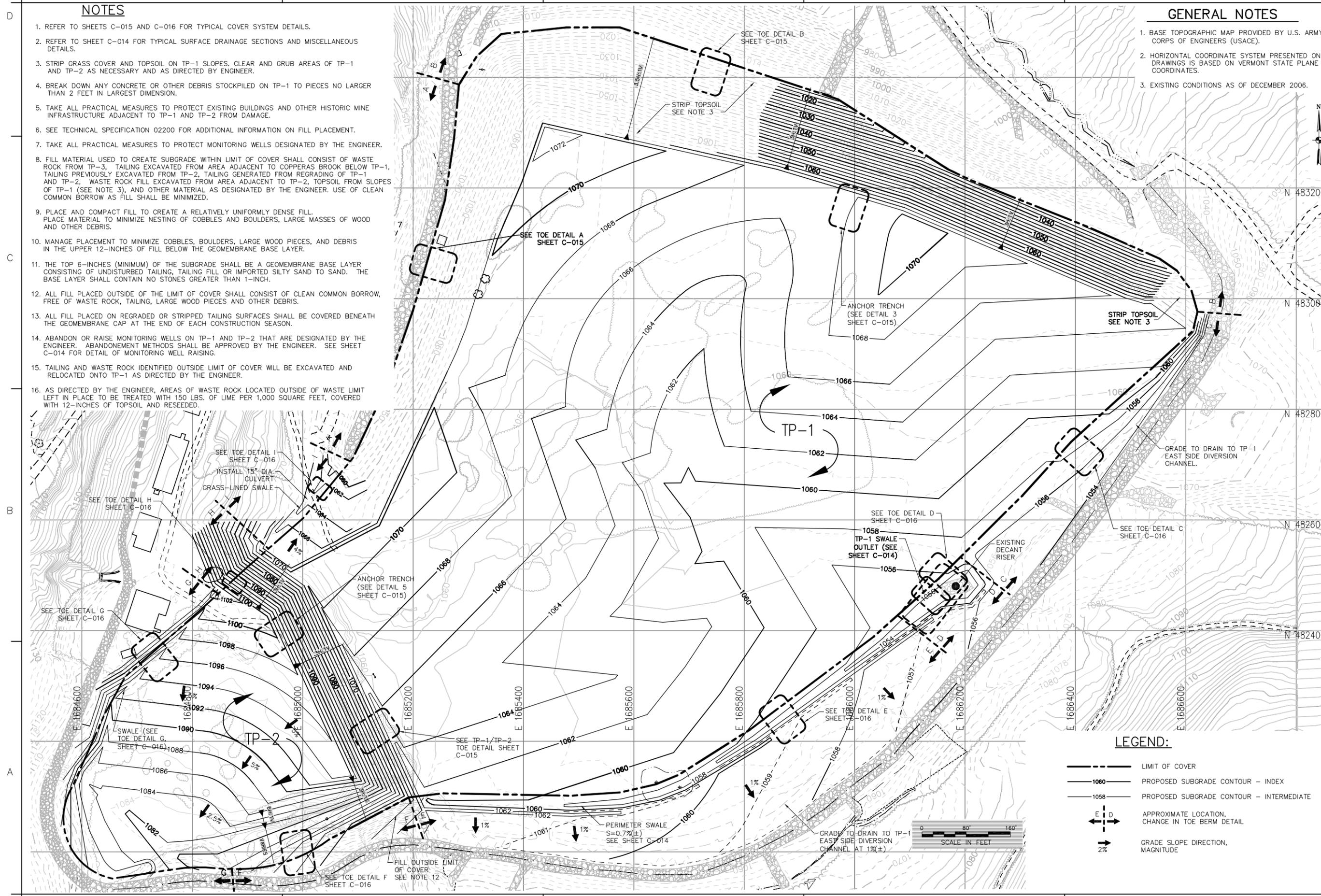
Rev.	Date	Design file no.
1	04/01/09	

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Dwn by:	AUG/GJB
Reviewed by:	JCC/DNH
Submitted by:	URS CORPORATION
File name:	NTCRA Closure.dwg
Project #:	39459345
Plot scale:	AS SHOWN

TP-1 AND TP-2  
SUBGRADE PLAN

Sheet reference number:  
**C-011**

Sheet 11 of 19

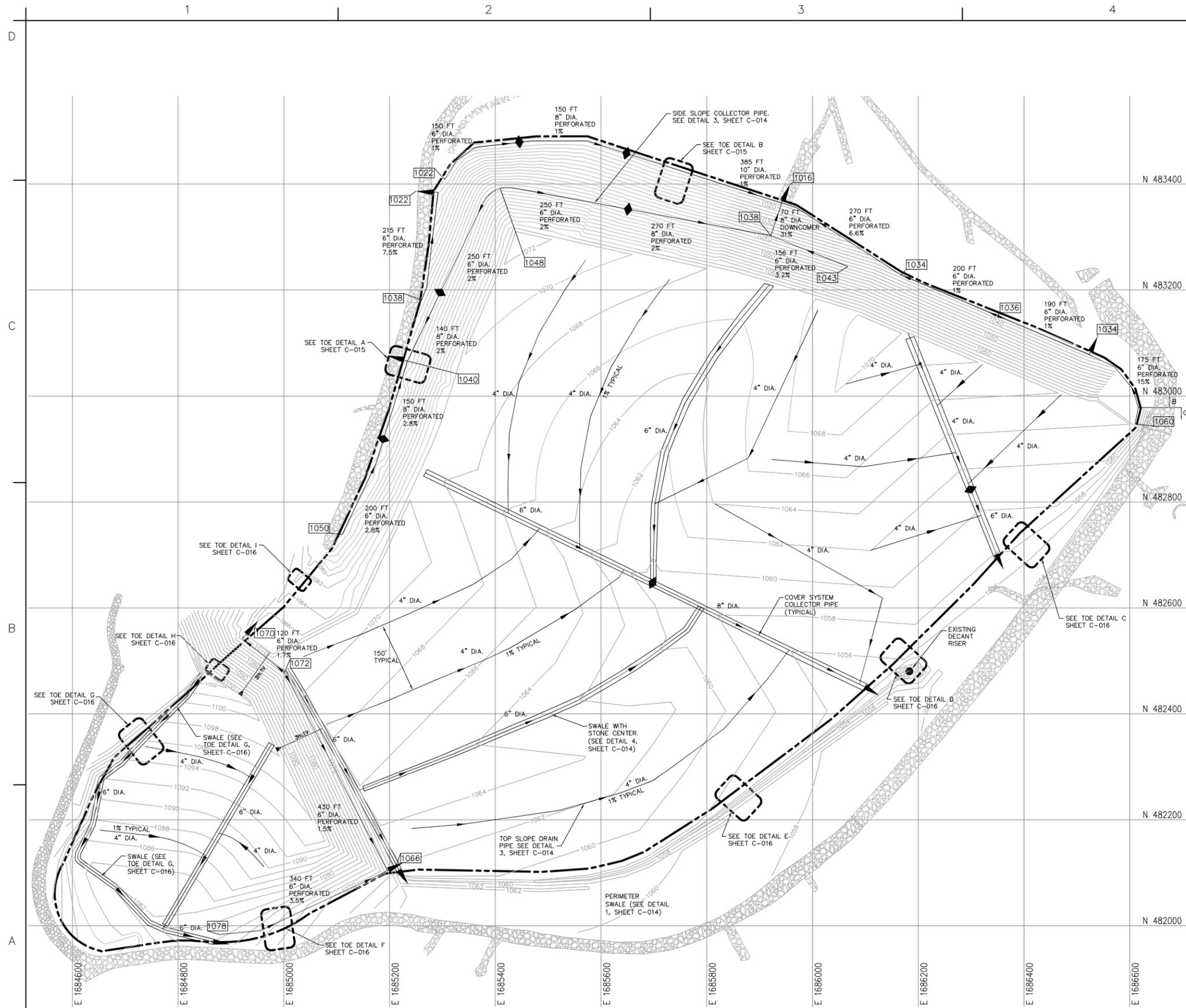


**LEGEND:**

- LIMIT OF COVER
- 1080 --- PROPOSED SUBGRADE CONTOUR - INDEX
- 1058 --- PROPOSED SUBGRADE CONTOUR - INTERMEDIATE
- APPROXIMATE LOCATION, CHANGE IN TOE BERM DETAIL
- GRADE SLOPE DIRECTION, MAGNITUDE

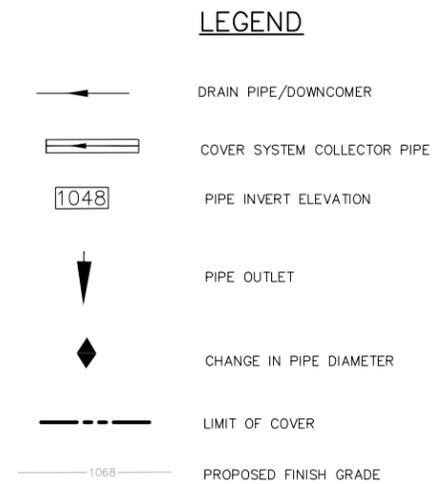
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- ### NOTES
- ALL PIPE AND FITTINGS SHALL BE EQUIVALENT TO HANCOR, INC. "AASHTO PIPE" HIGH DENSITY POLYETHYLENE PIPE.
  - ALL PIPE DIAMETERS ARE NOMINAL.
  - GEOCOMPOSITE DRAIN NET USED ON SLOPES STEEPER THAN 6H:1V SHALL BE A TRI-AXIAL, DOUBLE SIDED MATERIAL WITH A TRANSMISSIVITY AS STATED IN THE SPECIFICATIONS (HT DGC).
  - GEOCOMPOSITE DRAIN NET USED ON SLOPES BETWEEN 6H:1V AND 5% SHALL BE A TRI-AXIAL, DOUBLE SIDED MATERIAL WITH A TRANSMISSIVITY AS STATED IN THE SPECIFICATIONS (LT DGC).
  - GEOCOMPOSITE DRAIN NET USED ON SLOPES OF 5% OR LESS SHALL BE A TRI-AXIAL, DOUBLE OR SINGLE SIDED MATERIAL WITH A TRANSMISSIVITY AS STATED IN THE SPECIFICATIONS (LT DGC).
  - DRAIN PIPES SHOWN ON SIDE SLOPE OF TP-1 SHALL BE PERFORATED PIPE WRAPPED IN A GEOTEXTILE. SEE DETAIL 3, SHEET C-014.
  - THE DOWNCOMER SHALL BE SOLID PIPE.
  - ALL COVER SYSTEM COLLECTOR PIPES SHALL BE PERFORATED PIPE WRAPPED IN A GEOTEXTILE.
  - WHERE TP-1 AND TP-2 PERFORATED DRAIN PIPES OR COLLECTOR PIPES EXIT THROUGH THE TOE BERM, THE LAST 10 FEET OF PIPE SHALL BE SOLID.
  - ALL PIPES SHALL HAVE END CAPS.
  - ALL PIPE OUTLETS SHALL HAVE A PREFABRICATED RODENT GUARD EQUIVALENT TO ADVANCED DRAINAGE SYSTEM "ANIMAL GUARD (FINGER TYPE)".
  - THE ENGINEER SHALL ADJUST LAYOUT AND SIZING OF DRAINAGE SYSTEM TO MATCH FINAL SUBGRADE OF TP-1 AND TP-2, AS NECESSARY. THE FOLLOWING SLOPE LENGTHS SHALL NOT BE EXCEEDED WITHOUT COLLECTOR PIPES TO DRAIN HT DGC.

SLOPE	SLOPE LENGTH
3H:1V	100 FEET
3.5H:1V	100 FEET
4H:1V	100 FEET
5H:1V	100 FEET
6H:1V	100 FEET
  - DRAIN PIPES ON SLOPES LESS THAN 6H:1V SHALL GENERALLY HAVE A SLOPE OF NO LESS THAN 1% AND BE SPACED NO MORE THAN 150 FEET APART. MODIFICATION TO LAYOUT SHOWN IS ANTICIPATED BASED ON FINAL COVER SYSTEM CONTOURS. MODIFICATIONS SHALL BE APPROVED BY ENGINEER.



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ELIZABETH MINE  
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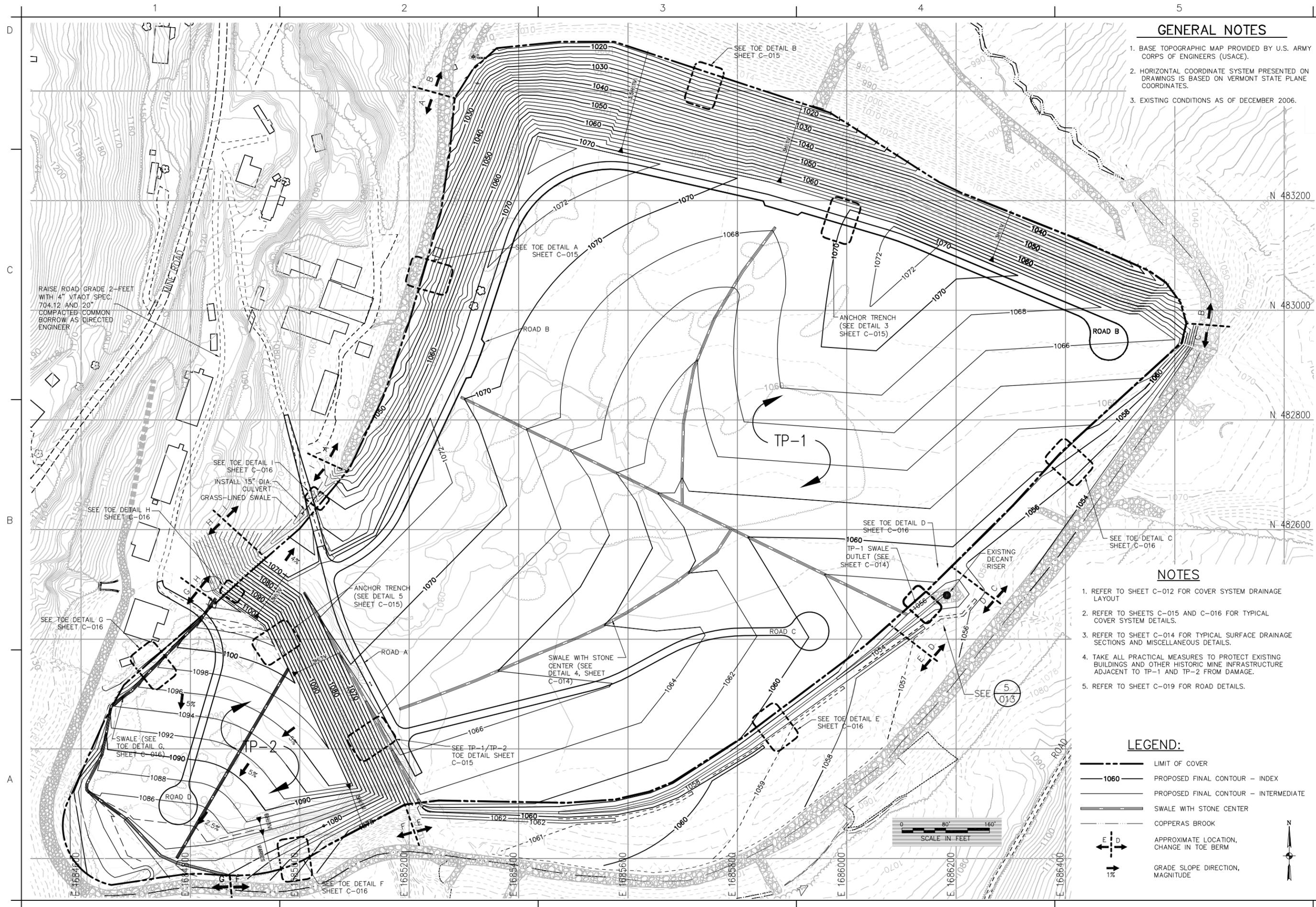
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Designed by:	Rev. 1
AUG	04/01/09
Dwn by:	Design file no.
AUG/GJB	
Reviewed by:	Project #:
JCC/DNH	39459345
Submitted by:	File name/NTCRA Closure.dwg
URS CORPORATION	
	Plot scale: AS SHOWN

TP-1 AND TP-2  
COVER SYSTEM DRAINAGE  
PLAN

Sheet reference number:  
**C-012**  
Sheet 12 of 19

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### GENERAL NOTES

1. BASE TOPOGRAPHIC MAP PROVIDED BY U.S. ARMY CORPS OF ENGINEERS (USACE).
2. HORIZONTAL COORDINATE SYSTEM PRESENTED ON DRAWINGS IS BASED ON VERMONT STATE PLANE COORDINATES.
3. EXISTING CONDITIONS AS OF DECEMBER 2006.

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Work	Description	Date	Appr.
4	FINAL USACE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USACE REVIEW	9/7/07	
1	WORK IN PROGRESS		

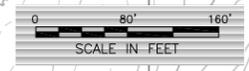
Designed by:	Rev.
AUG	04/01/09
Dwn by:	Design file no.
AUG/GJB	
Reviewed by:	Project #:
JCC/DNH	39459345
Submitted by:	File name/NTCRA Closure.dwg
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### NOTES

1. REFER TO SHEET C-012 FOR COVER SYSTEM DRAINAGE LAYOUT
2. REFER TO SHEETS C-015 AND C-016 FOR TYPICAL COVER SYSTEM DETAILS.
3. REFER TO SHEET C-014 FOR TYPICAL SURFACE DRAINAGE SECTIONS AND MISCELLANEOUS DETAILS.
4. TAKE ALL PRACTICAL MEASURES TO PROTECT EXISTING BUILDINGS AND OTHER HISTORIC MINE INFRASTRUCTURE ADJACENT TO TP-1 AND TP-2 FROM DAMAGE.
5. REFER TO SHEET C-019 FOR ROAD DETAILS.

### LEGEND:

- LIMIT OF COVER
- 1060— PROPOSED FINAL CONTOUR - INDEX
- PROPOSED FINAL CONTOUR - INTERMEDIATE
- SWALE WITH STONE CENTER
- COPPERAS BROOK
- APPROXIMATE LOCATION, CHANGE IN TOE BERM
- 1% GRADE SLOPE DIRECTION, MAGNITUDE



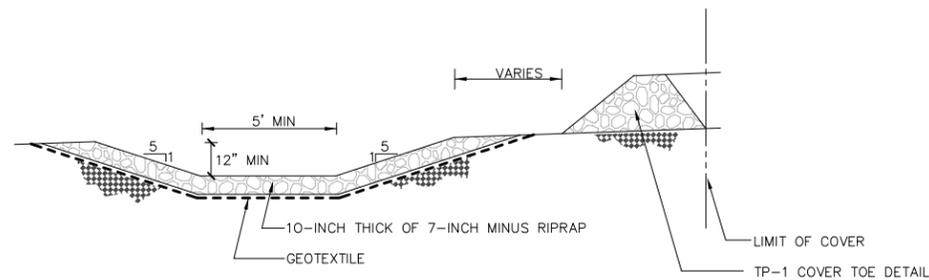
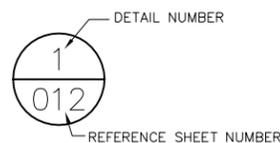
TP-1 AND TP-2  
FINAL GRADING PLAN

Sheet reference number:  
**C-013**

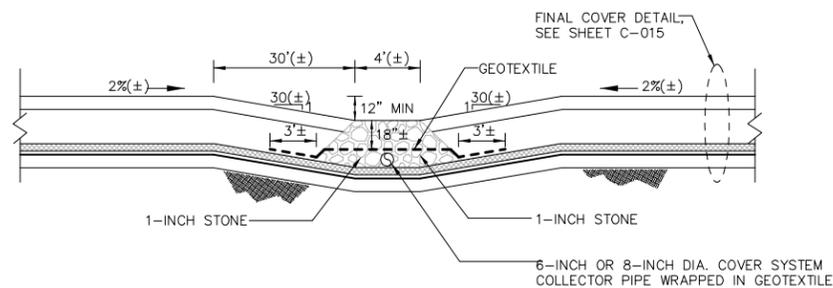
Sheet 13 of 19

P:\acad-project\USACE-ELIZABETH-MINE-STRAFFORD-VT\dwg\NTCRA Closure.dwg, C-014\_TP-1&2 Surface Drainage Details, 4/22/2009 4:49:39 PM

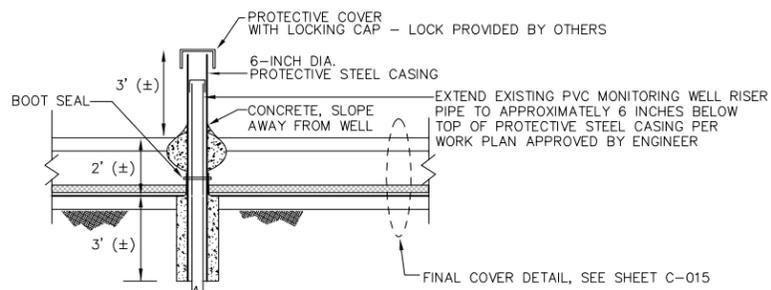
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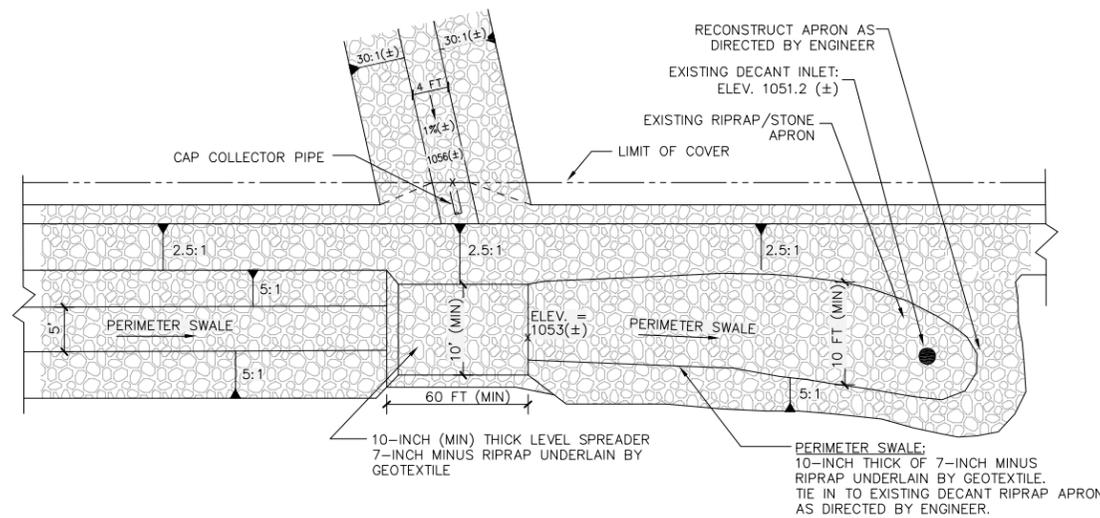
**1**  
012 PERIMETER SWALE  
NOT TO SCALE



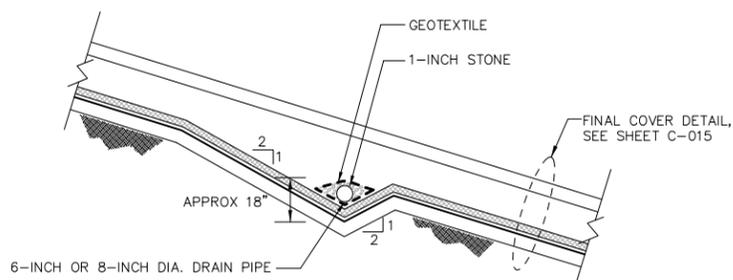
**4**  
013 SURFACE SWALES WITH STONE CENTER  
NOT TO SCALE



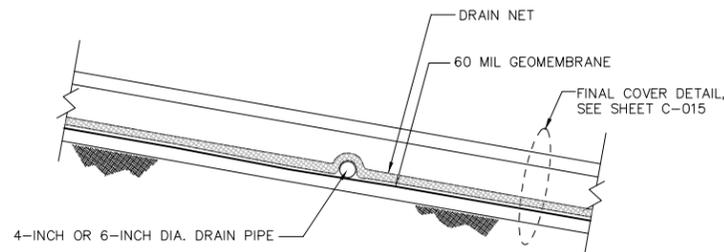
**2**  
011 MONITORING WELL DETAIL  
NOT TO SCALE



**5**  
013 TP-1 SWALE OUTLET & DECANT INLET  
NOT TO SCALE



**3**  
012 SIDE SLOPE COLLECTOR PIPE  
NOT TO SCALE



**6**  
012 TOP SLOPE DRAINAGE PIPE  
NOT TO SCALE

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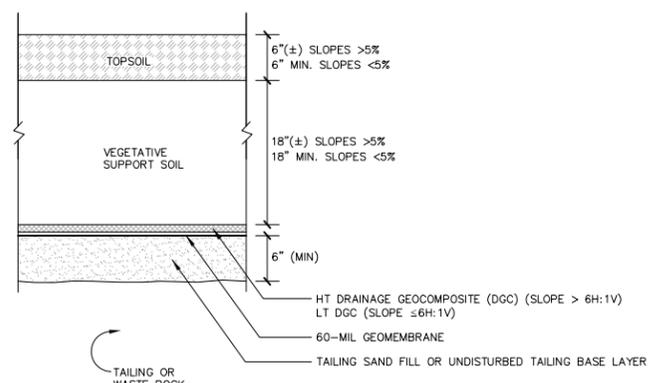
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4	FINAL USAGE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USAGE REVIEW	9/7/07	
1	WORK IN PROGRESS		

Designed by: AUG	Rev. 1
Dwn by: AUG/GJB	Date: 04/01/09
Reviewed by: JCC/CHH	Design file no.
Submitted by: URS CORPORATION	Project #: 39459945
	File name: NTCRA Closure.dwg
	Plot scale: AS SHOWN

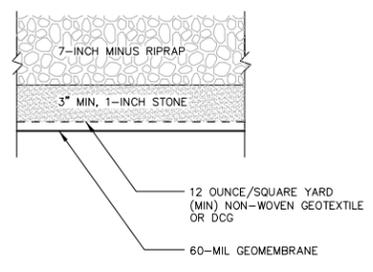
TP-1 AND TP-2  
SURFACE DRAINAGE AND  
MISCELLANEOUS DETAILS

Sheet reference number:  
**C-014**  
Sheet 14 of 19

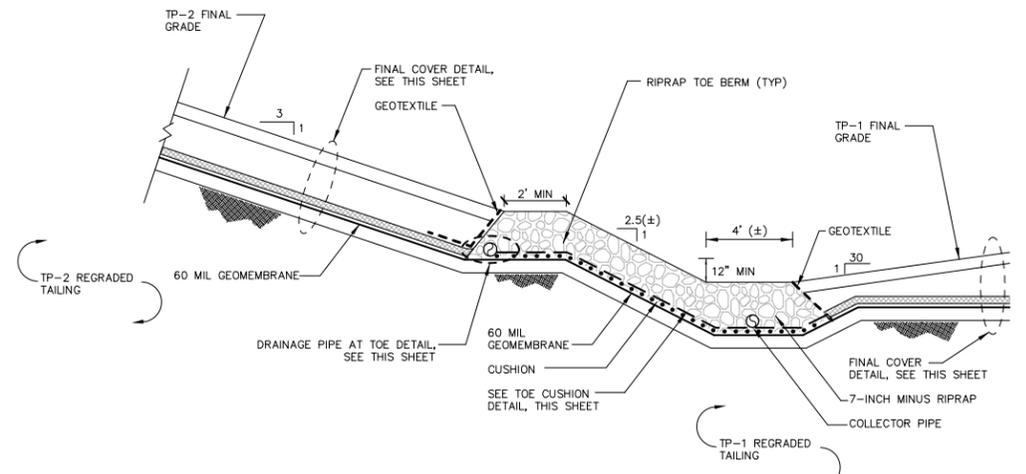
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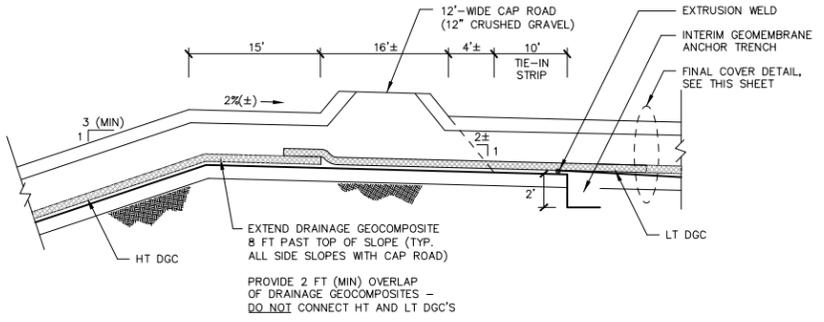
1 FINAL COVER DETAIL  
013 NOT TO SCALE



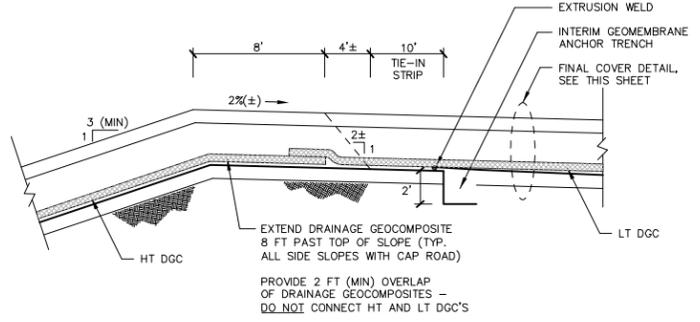
4 TOE CUSHION DETAIL  
016 NOT TO SCALE



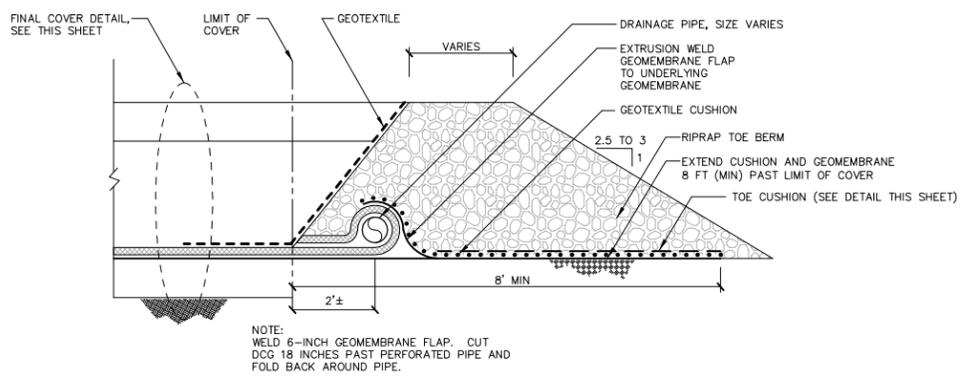
6 TP-1/TP-2 TOE DETAIL  
013 NOT TO SCALE



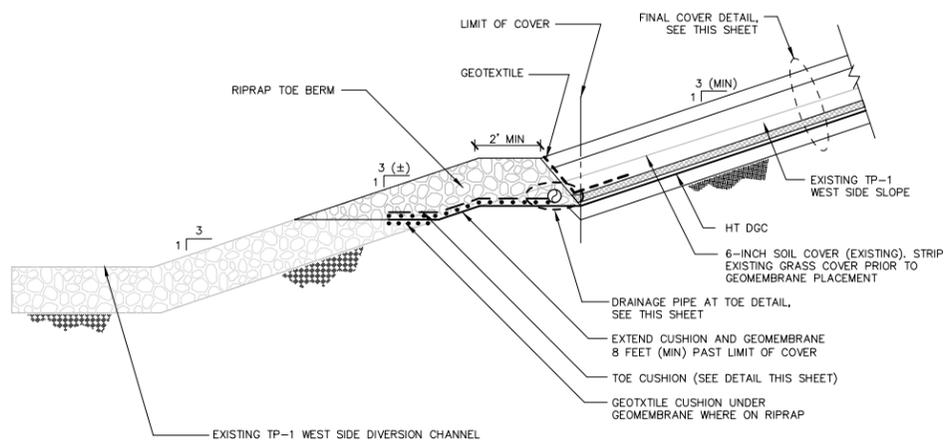
3 TOP SLOPE ANCHOR WITH ROAD  
013 NOT TO SCALE



5 TOP SLOPE ANCHOR WITHOUT ROAD  
013 NOT TO SCALE

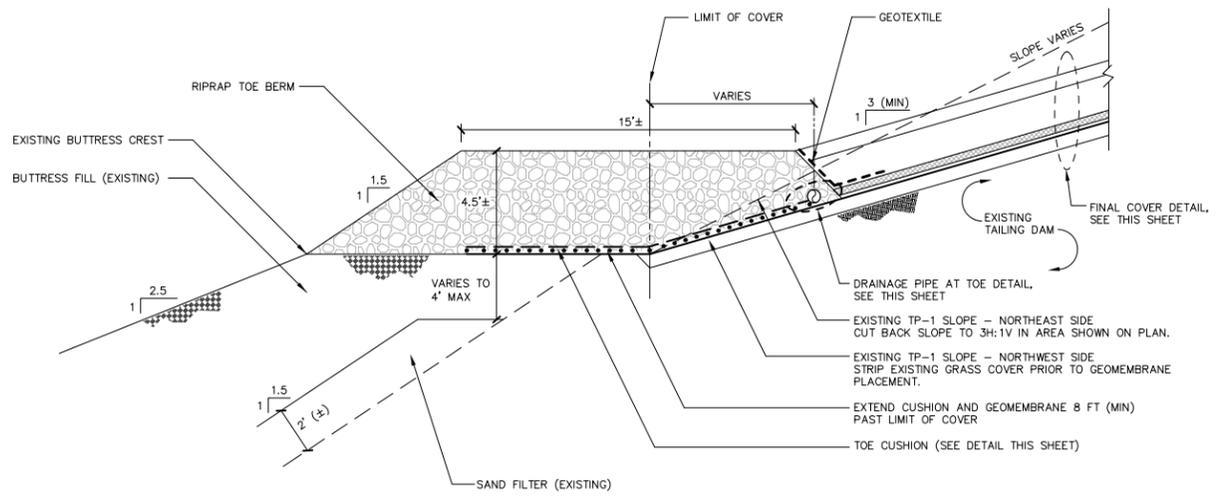


7 DRAINAGE PIPE AT TOE DETAIL  
015 NOT TO SCALE



4 TOE DETAIL A  
013 NOT TO SCALE

NOTE:  
ALL TOE BERMS SHALL BE CONSTRUCTED FROM 7-INCH MINUS RIPRAP.



8 TOE DETAIL B  
013 NOT TO SCALE

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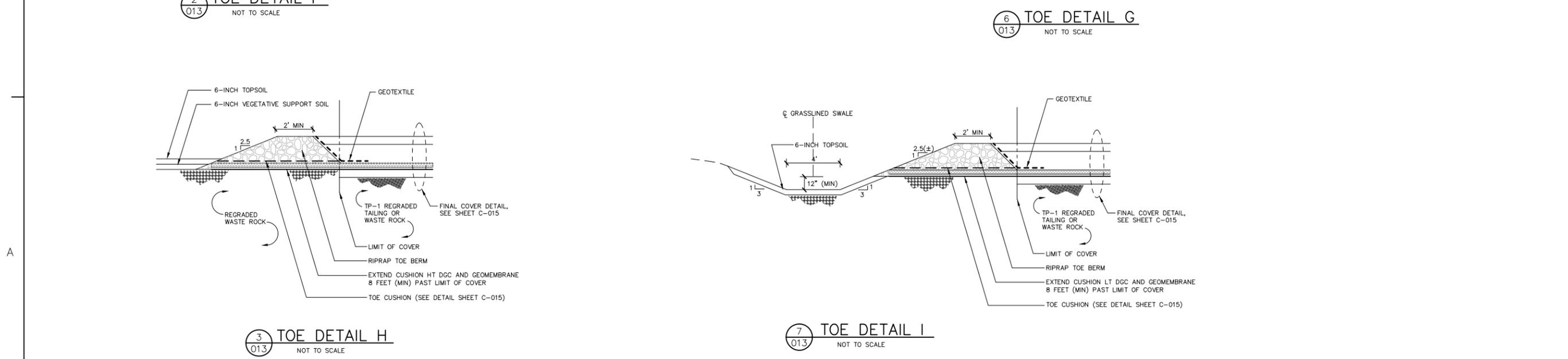
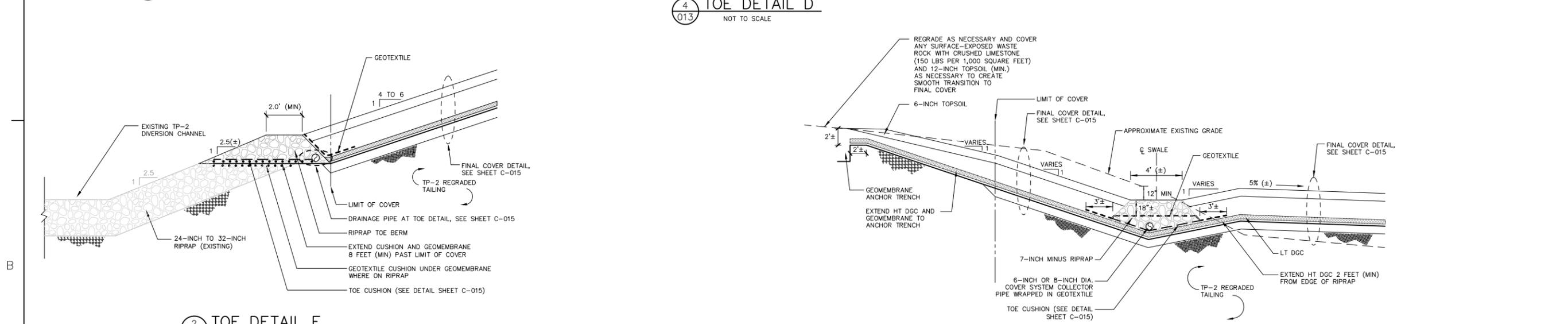
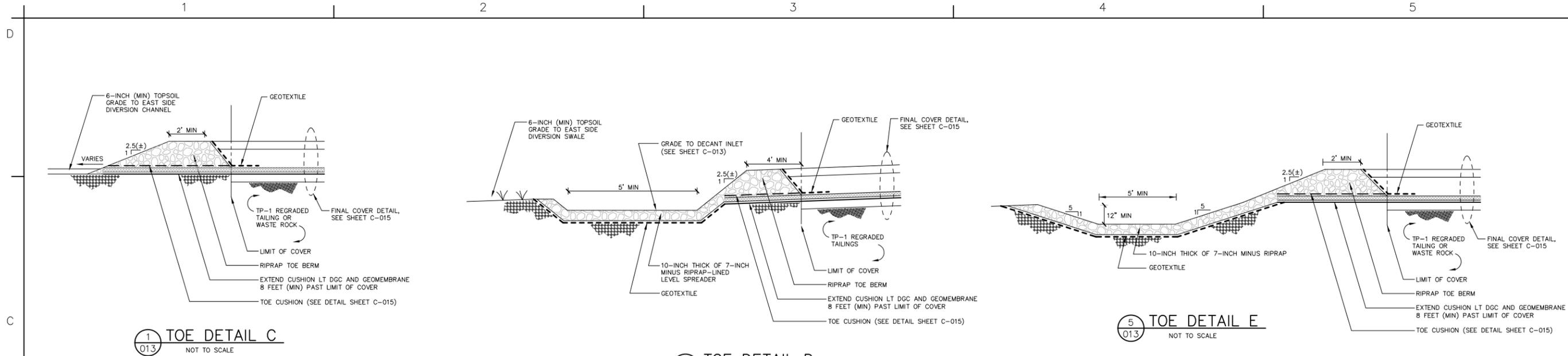
Mark	Description	Date	Appr
4	FINAL USAGE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USACE REVIEW	9/7/07	
1	WORK IN PROGRESS		

Designed by:	Rev. 1
AWG	Date: 04/01/09
Drawn by:	Design file no.
AUG/GJB	
Reviewed by:	Project #:
JCC/ONH	39459945
Submitted by:	File name: NTCRA Closure.dwg
URS CORPORATION	Plot scale: AS SHOWN

TP-1 AND TP-2  
TYPICAL DETAILS

Sheet reference number:  
**C-015**  
Sheet 15 of 19

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1	WORK IN PROGRESS	9/7/07	
2	USACE REVIEW	04/08	
3	DRAFT FINAL	04/08	
4	FINAL USAGE SUBMISSION	03/09	

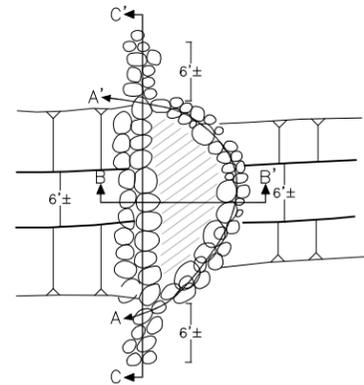
Designed by: AUG	Rev. 1	Date: 04/01/09
Dwn by: AUG/GJB	Design file no.	
Reviewed by: JCC/CHH	Project #: 39459345	
Submitted by: URS CORPORATION	File name: NTCRA Closure.dwg	
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TP-1 AND TP-2  
TYPICAL DETAILS

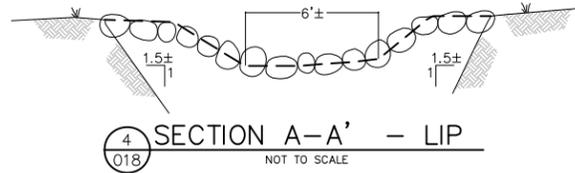
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**C-016**  
Sheet 16 of 19



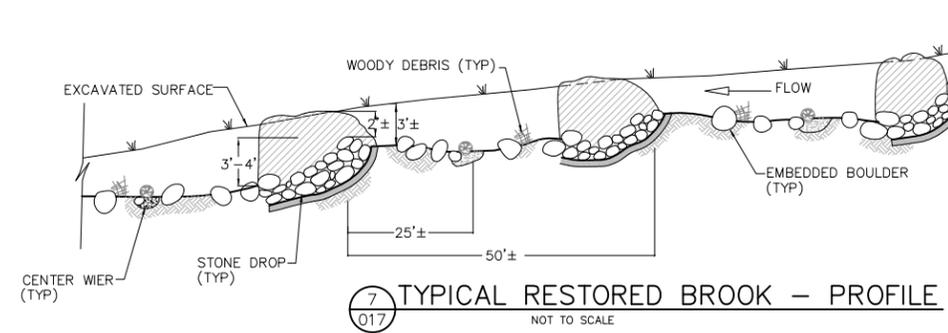
P:\acad-project\USACE-ELIZABETH-MINE-STRAFFORD-VT\dwg\NTCRA Closure.dwg, C-018 STREAM RESTORATION DETAILS, 4/22/2009 3:43:48 PM



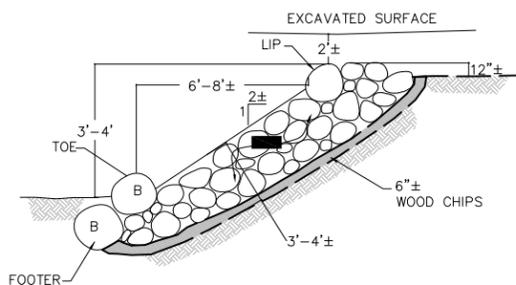
1 STONE DROP PLAN  
017 NOT TO SCALE



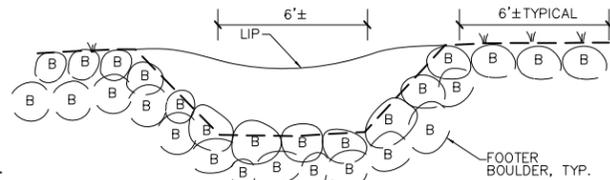
4 SECTION A-A' - LIP  
018 NOT TO SCALE



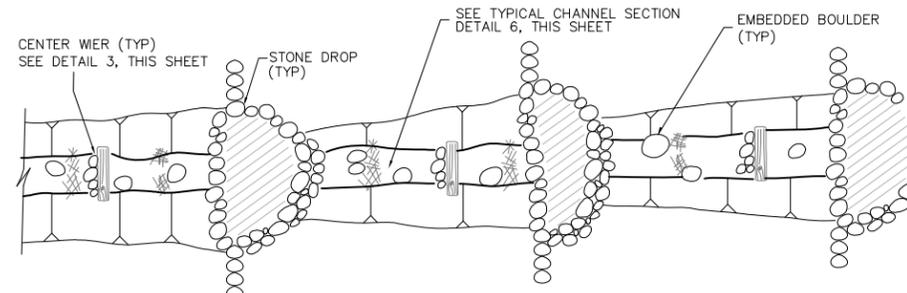
7 TYPICAL RESTORED BROOK - PROFILE  
017 NOT TO SCALE



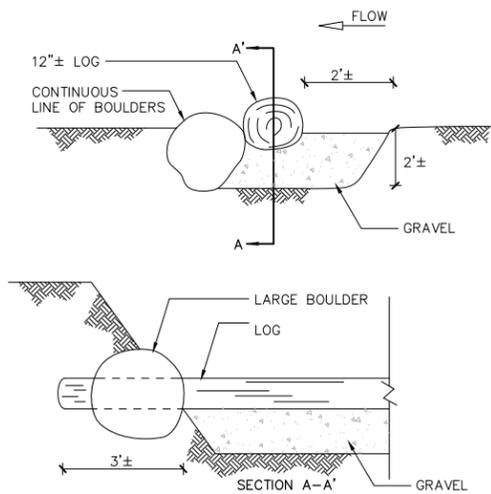
2 SECTION B-B'  
018 NOT TO SCALE



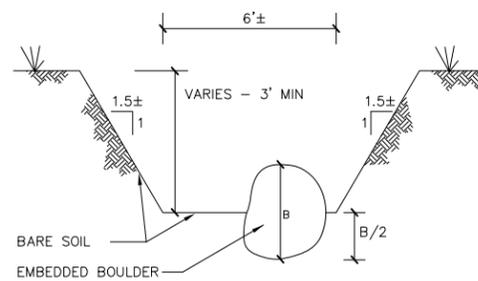
5 SECTION C-C' - TOE  
018 NOT TO SCALE



8 TYPICAL RESTORED BROOK - PLAN  
017 NOT TO SCALE



3 CENTER WIER  
LOOKING UPSTREAM  
018 NOT TO SCALE



NOTE: PLACE 3 TO 5 EMBEDDED BOULDERS  
BETWEEN EACH SET OF STONE DROPS  
6 TYPICAL CHANNEL  
SECTION  
018 NOT TO SCALE

LEGEND

- C = COBBLES
- B = BOULDERS

NOTES

1. BOULDERS TO HAVE A DIAMETER LARGER THAN 24 INCHES

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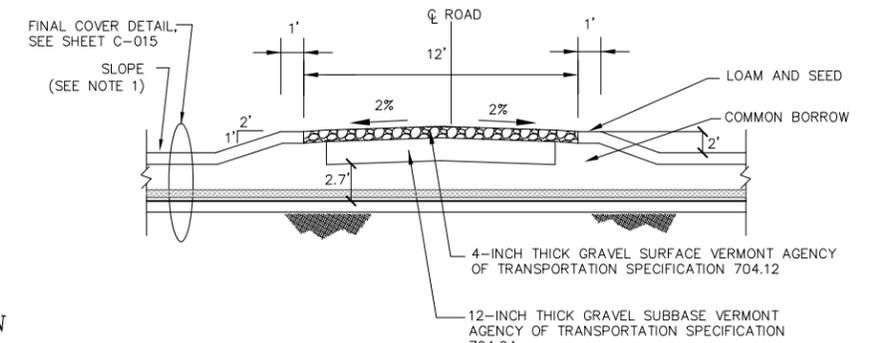
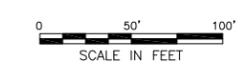
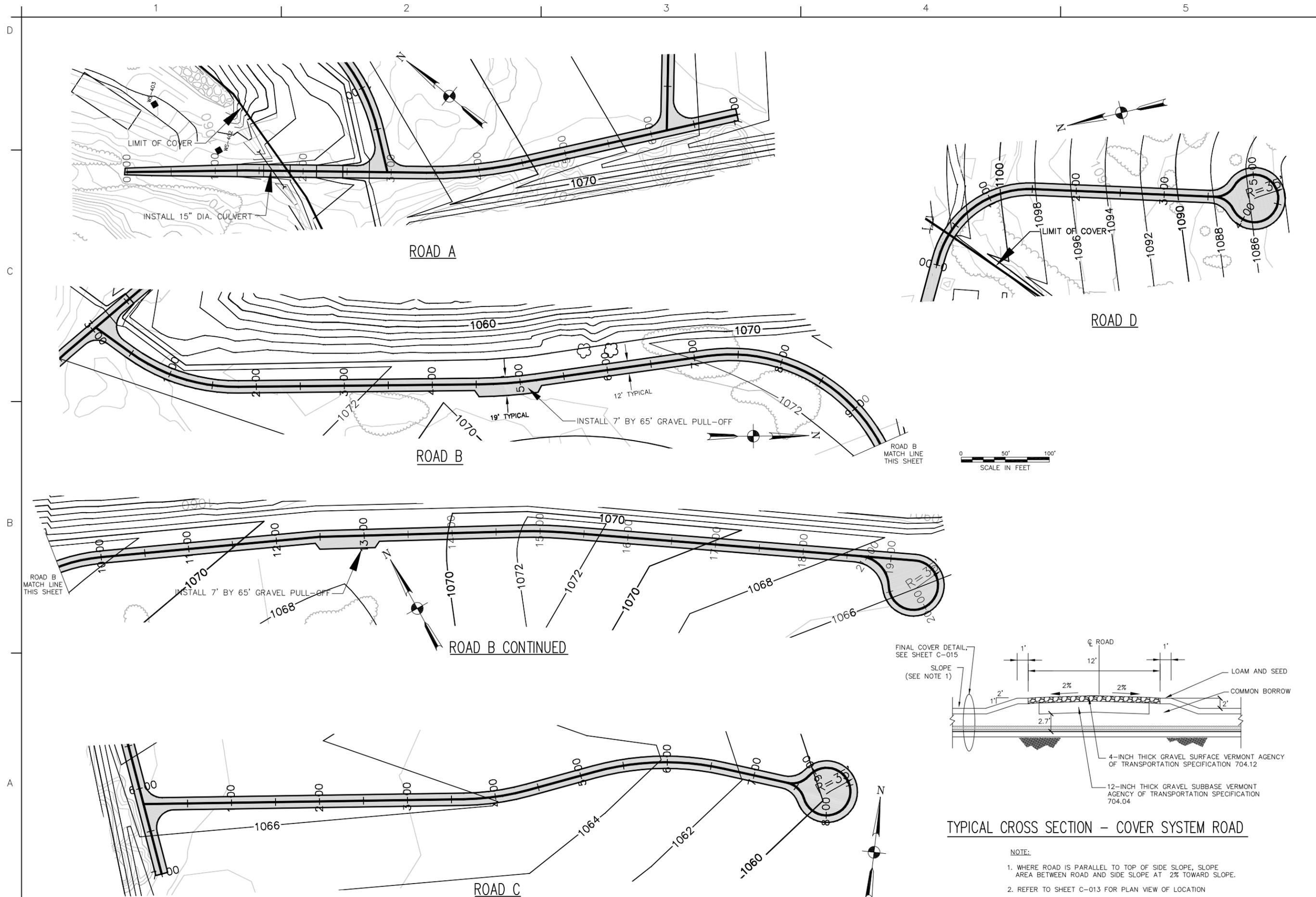
Mark	Description	Date	Appr
4	FINAL USACE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USACE REVIEW	9/7/07	
1	WORK IN PROGRESS		

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Drawn by: DWA	Design file no.:	
Reviewed by: JCC/ONH	Project #:	39459345
Submitted by: URS CORPORATION	File name: NTCRA Closure.dwg	
	Plot date:	AS SHOWN
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STREAM RESTORATION  
TYPICAL DETAILS

Sheet reference number:  
**C-018**  
Sheet 18 of 19

P:\acad-project\USACE-ELIZABETH-MINE-STRAFFORD-VT\dwg\NTCRA Closure.dwg, C-019 COVER SYSTEM ROADS, 4/2/2009 3:49:22 PM



TYPICAL CROSS SECTION - COVER SYSTEM ROAD

- NOTE:
- WHERE ROAD IS PARALLEL TO TOP OF SIDE SLOPE, SLOPE AREA BETWEEN ROAD AND SIDE SLOPE AT 2% TOWARD SLOPE.
  - REFER TO SHEET C-013 FOR PLAN VIEW OF LOCATION

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Mark	Description	Date	Appr
4	FINAL USACE SUBMISSION	03/09	
3	DRAFT FINAL	04/08	
2	USACE REVIEW	9/7/07	
1	WORK IN PROGRESS		

Designed by: AUG	Date: 04/01/09	Rev.:
Drawn by: AUG/GJB	Design file no.:	-
Reviewed by: JCC/ONH	Project #:	39459345
Submitted by: URS CORPORATION	File name: NTCRA Closure.dwg	Plot scale: AS SHOWN

TP-1 AND TP-2  
COVER SYSTEM ROAD PLAN

Sheet reference number:  
**C-019**

Sheet 19 of 19