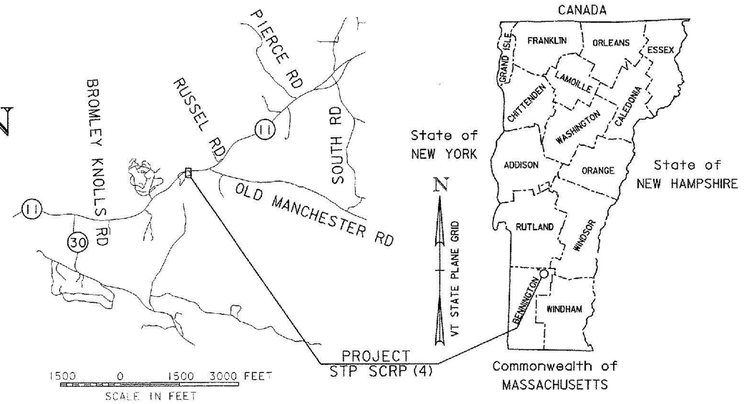
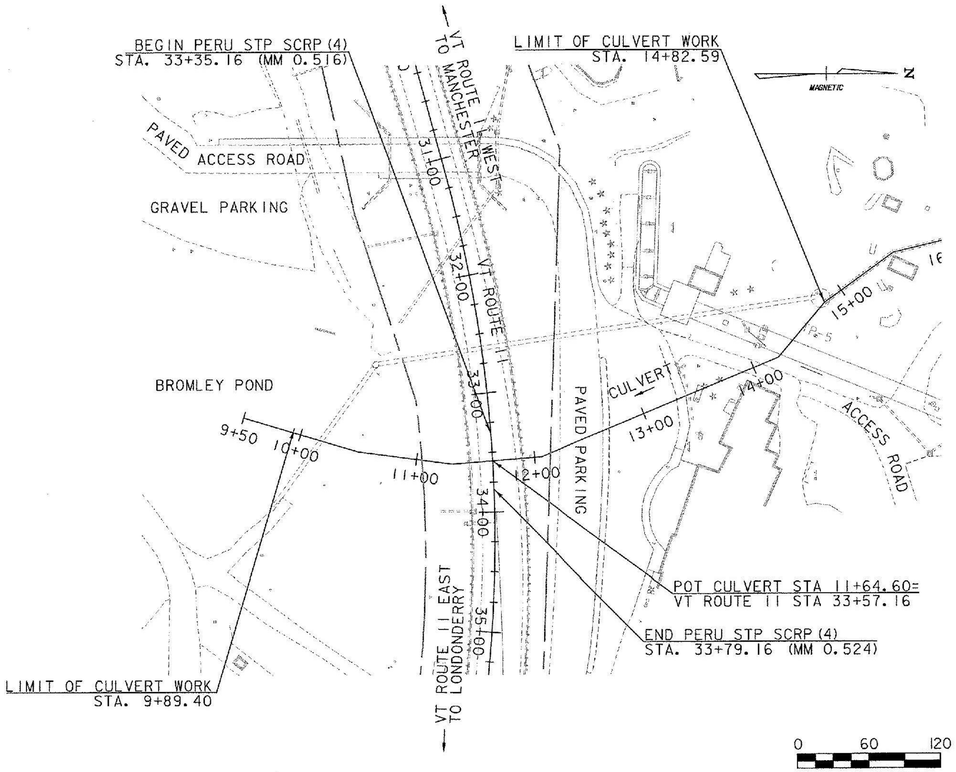
STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
TOWN OF PERU
COUNTY OF BENNINGTON
VT ROUTE 11 (MINOR ARTERIAL)

PROJECT LOCATION: BEGINNING IN THE TOWN OF PERU ON VT ROUTE 11 AT STATION 33+35.16 (MM 0.516) AND EXTENDING EASTERLY 44.00 FEET (0.008 MILE) TO STATION 33+79.16 (MM 0.524)
LENGTH OF PROJECT =44.00 FEET (0.008 MILE)
LENGTH OF CULVERT WORK =493.19 FEET (0.093 MILE)
PROJECT DESCRIPTION: ABANDON EXISTING CULVERT, CONSTRUCTION OF A NEW CULVERT AND APPURTENANT ROADWAY WORK.



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 2

SURVEYED BY :L. ORVIS PC/G. HITCHCOCK
SURVEYED DATE :5/29/2008, 8/5/2008, 4/3/2012

DATUM
VERTICAL ASSUMED
HORIZONTAL ASSUMED

Record Plans
Contractor: RENAUD BROTHERS, INC.
Resident Engineer: RONALD LEMAIRE (2015 - 2017) / JUDY GILMORE (2018)
Construction Began: JUNE 2, 2015
Construction Complete: JUNE 11, 2018
Record Plans By: JUDY GILMORE

I hereby certify that all construction required by this set of drawings has been accomplished as indicated herein.

BY: e-Signed by Judy Gilmore on 2018-09-20 16:39:33 GMT Resident Engineer

Date: September 20, 2018

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

DIRECTOR OF PROJECT DELIVERY
APPROVED _____ DATE 12/31/2014

PROJECT MANAGER : KEN UPMAL, P.E.

PROJECT NAME : PERU
PROJECT NUMBER : STP SCRP (4)

SHEET 1 OF 45 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (CULVERT)

Version 2013.11.25.09

INDEX OF SHEETS

PLAN SHEETS

STRUCTURES DETAIL SHEETS

• ADDED SHEETS FOLLOWING SHEET 8
- CHANGE DETAIL #1
- CHANGE DETAIL #2
- SINGLE LEAF ACCESS DOOR
SHEET 9 REPLACED
SHEET 12 REPLACED

•• SHEET 29 REPLACED

STANDARDS LIST

B-5	SLOPE GRADING, EMBANKMENTS, MUCK	06-01-1994
C-10	CURBING	02-11-2008
D-11	STEEL OR IRON GRATES& COVERS (TYPE A)	06-01-1994
D-15	PRECAST REINF CONC. MH-GRATES, CAST IRON GRATE WITH FRAME, TYPE D & E	06-01-1994
D-20	HIGHWAY CROSSING FOR UNDERGROUND UTILITIES	03-03-2003
D-22	SANITARY SEWER SYSTEMS	03-10-1995
E-119	UTILITY WORK ZONE	03-01-2004
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	08-08-1995
E-171A	TRAFFIC CONTROL SIGNALS GENERAL NOTES & DETAILS	08-09-1995
E-171B	TRAFFIC CONTROL SIGNALS MISC. DETAILS	08-09-1995
E-173	PULL BOXES AND JUNCTION BOXES	08-09-1995
E-175	POWER DROP STANCHIONS	06-08-2009
E-191	PAVEMENT MARKING DETAILS	02-01-1999
E-192	PAVEMENT MARKING DETAILS	10-12-2000
E-193	PAVEMENT MARKING DETAILS	08-18-1995
F-2	CHAIN LINK FENCE, TYPE I DETAILS	06-01-1994
F-4	CHAIN LINK FENCE, TYPE II DETAILS	06-01-1994
G-1	STEEL BEAM GUARDRAIL DETAILS (POST, DELINEATOR, TYPICALS)	02-10-2014
T-1	TRAFFIC CONTROL GENERAL NOTES	08-06-2012
T-10	CONVENTIONAL ROADS CONSTRUCTION APPROACH SIGNING	08-06-2012
T-17	TRAFFIC CONTROL MISCELLANEOUS DETAILS	08-06-2012
T-28	CONSTRUCTION SIGN DETAILS	08-06-2012
T-29	CONSTRUCTION SIGN DETAILS	08-06-2012
T-30	CONSTRUCTION SIGN DETAILS	08-06-2012
T-31	CONSTRUCTION SIGN DETAILS	08-06-2012
T-36	CONSTRUCTION ZONE LONGITUDNAL DROP-OFFS FOR PAVING	08-06-2012
T-45	SQUARE TUBE SIGN POST AND ANCHOR	01-02-2013

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: February 2014

DRAINAGE AREA : 120 acres
CHARACTER OF TERRAIN : Mountainous, open and forested, steep
STREAM CHARACTERISTICS : Perrenial, alluvial and wandering
NATURE OF STREAMBED : Large boulders and debris

PEAK FLOW DATA

Q 2.33 =	58 cfs	Q 50 =	75 cfs
Q 10 =	125 cfs	Q 100 =	225 cfs
Q 25 =	155 cfs	Q 500 =	N/A

DATE OF FLOOD OF RECORD: Unknown
ESTIMATED DISCHARGE: Unknown
WATER SURFACE ELEV.: Unknown
NATURAL STREAM VELOCITY : Unknown
ICE CONDITIONS : Moderate
DEBRIS: Severe
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? N/A
IS ORDINARY RISE RAPID? N/A
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
IF YES, DESCRIBE: Upstream end is controlled by a headwall and 36" CMP, downstream condition is free flow.

WATERSHED STORAGE: 1%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated Metal Pipe
YEAR BUILT: CA 1977
CLEAR SPAN(NORMAL TO STREAM): 3'
VERTICAL CLEARANCE ABOVE STREAMBED: 3'
WATERWAY OF FULL OPENING: 7.07 sq. ft.
DISPOSITION OF STRUCTURE: Abandon in place
TYPE OF MATERIAL UNDER SUBSTRUCTURE: N/A

WATER SURFACE ELEVATIONS AT:

Q2.33 =	N/A	VELOCITY =	-
Q10 =	N/A	"	-
Q25 =	N/A	"	-
Q50 =	N/A	"	-
Q100 =	N/A	"	-

LONG TERM STREAMBED CHANGES: None noted

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: N/A - Culvert headwall is not in roadway vicinity
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Peru — DISTANCE:
HIGHWAY # : — STRUCTURE #:
CLEAR SPAN: — CLEAR HEIGHT:
YEAR BUILT: — FULL WATERWAY:
STRUCTURE TYPE: Headwall

DOWNSTREAM STRUCTURE

TOWN: Peru — DISTANCE: 24'
HIGHWAY # : — STRUCTURE #:
CLEAR SPAN: — CLEAR HEIGHT:
YEAR BUILT: — FULL WATERWAY:
STRUCTURE TYPE: Discharge to pond

LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
TONNAGE							
INVENTORY							
POSTING							
OPERATING							
COMMENTS:	TABLE TO BE COMPLETED BY CONTRACTOR'S DESIGNER						

PROPOSED STRUCTURE

STRUCTURE TYPE: 72" PCCSP/CAAP

CLEAR SPAN(NORMAL TO STREAM): 6'
VERTICAL CLEARANCE ABOVE STREAMBED: 6'
WATERWAY OF FULL OPENING: 28.3 sq. ft.

WATER SURFACE ELEVATIONS AT: (REPORTED @ OUTFALL)

Q2.33 =	1932.03'	VELOCITY=	6.9 FPS
Q10 =	1932.99'	"	8.7 FPS
Q25 =	1933.35'	"	9.4 FPS
Q50 =	1933.68'	"	10.0 FPS
Q100 =	1934.10'	"	10.9 FPS

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY:
RELIEF ELEVATION: N/A - Culvert headwall is not in roadway vicinity
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: N/A
VERTICAL CLEARANCE: @ Q50 = 2.3'

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Stone Fill, Type II

PERMIT INFORMATION

AVERAGE DAILY FLOW:	0.63 cfs	
ORDINARY LOW WATER:	0.20 cfs	DEPTH OR ELEVATION:
ORDINARY HIGH WATER:	25 cfs	0.5'
		~2.64'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: N/A
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY AREA OF FULL OPENING: N/A

ADDITIONAL INFORMATION

TRAFFIC MAINTENANCE NOTES

1. ONE-WAY ALTERNATING TRAFFIC WITH TEMPORARY TRAFFIC SIGNAL ON VT ROUTE 11
2. MAINTAIN PEDESTRIAN ACCESS TO BROMLEY MOUNTAIN SKI RESORT

DESIGN VALUES

1. DESIGN LIVE LOAD		N/A
2. FUTURE PAVEMENT	d_p:	7.0 INCH
3. DESIGN SPAN	L:	6.0 FEET
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	
5. PRESTRESSING STRAND	f_y:	
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	3500 PSI
11. CONCRETE, CLASS C	f'_c:	
12. REINFORCING STEEL (LEVEL I)	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	
14. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	19 KSF
15. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	0.45
16. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	
17. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	
18. PILE RESISTANCE FACTOR	ϕ:	
19. LATERAL PILE DEFLECTION	Δ:	
20. BASIC WIND SPEED	V_{3s}:	
21. MINIMUM GROUND SNOW LOAD	p_g:	
22. SEISMIC DATA — PGA: 0	S_s:	
	S_1:	
23.		
24.		
25.		
26.		

VT ROUTE 11 TRAFFIC DATA

YEAR	ADT	DHV	%D	%T	ADTT	
2015	4200	650	53	8.8	480	20 year ESAL for flexible pavement from 2015 to 2035 : 3,703,00
2035	4600	710	53	12.8	770	40 year ESAL for flexible pavement from 2015 to 2055 : 8,380,000
						Posted Speed: 50 mph

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106p11.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
PRELIMINARY INFORMATION SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 2 OF 45

GENERAL INFORMATION

SYMBOLOGY LEGEND NOTE

THE SYMBOLOGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLOGY. THE SYMBOLOGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLOGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

PROJECT SPECIFIC LEGEND

CODE	DESCRIPTION
DC	DUST CONTROL 609.10 & 15
BL	CONSTRUCTION BASELINE

R.O.W. ABBREVIATIONS (CODES) & SYMBOLS

POINT	CODE	DESCRIPTION
	CH	CHANNEL EASEMENT
	CONST	CONSTRUCTION EASEMENT
	CUL	CULVERT EASEMENT
	D&C	DISCONNECT & CONNECT
	DIT	DITCH EASEMENT
	DR	DRAINAGE EASEMENT
	DRIVE	DRIVEWAY EASEMENT
	EC	EROSION CONTROL
	HWY	HIGHWAY EASEMENT
	I&M	INSTALL & MAINTAIN EASEMENT
	LAND	LANDSCAPE EASEMENT
	R&RES	REMOVE & RESET
	R&REP	REMOVE & REPLACE
	SR	SLOPE RIGHT
	UE	UTILITY EASEMENT
	(P)	PERMANENT EASEMENT
	(T)	TEMPORARY EASEMENT
■	BNDNS	BOUND SET
⧈	BNDNS	BOUND TO BE SET
●	IPNS	IRON PIN SET
◎	IPNS	IRON PIN TO BE SET
⊠	CALC	EXISTING ROW POINT
○	PROW	PROPOSED ROW POINT
[LENGTH]		LENGTH CARRIED ON NEXT SHEET

COMMON TOPOGRAPHIC POINT SYMBOLS

POINT	CODE	DESCRIPTION
	APL	BOUND APPARENT LOCATION
	BM	BENCH MARK
	BND	BOUND
	CB	CATCH BASIN
	COMB	COMBINATION POLE
	DITHR	DROP INLET THROATED DNC
	EL	ELECTRIC POWER POLE
	FPOLE	FLAGPOLE
	GASFIL	GAS FILLER
	GP	GUIDE POST
	GSO	GAS SHUT OFF
	GUY	GUY POLE
	GUYW	GUY WIRE
	GV	GATE VALUE
	H	TREE HARDWOOD
	HCTRL	CONTROL HORIZONTAL
	HVCTRL	CONTROL HORIZ. & VERTICAL
	HYD	HYDRANT
	IP	IRON PIN
	IPIPE	IRON PIPE
	LI	LIGHT - STREET OR YARD
	MB	MAILBOX
	MH	MANHOLE (MH)
	MM	MILE MARKER
	PM	PARKING METER
	PMK	PROJECT MARKER
	POST	POST STONE/WOOD
	RRSIG	RAILROAD SIGNAL
	RRSL	RAILROAD SWITCH LEVER
	S	TREE SOFTWOOD
	SAT	SATELLITE DISH
	SHRUB	SHRUB
	SIGN	SIGN
	STUMP	STUMP
	TEL	TELEPHONE POLE
	TIE	TIE
	TSIGN	SIGN W/DOUBLE POST
	VCTRL	CONTROL VERTICAL
	WELL	WELL
	WSO	WATER SHUT OFF

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

CODE	DESCRIPTION
PC	POINT OF CURVATURE
PI	POINT OF INTERSECTION
CC	CENTER OF CURVE
PT	POINT OF TANGENCY
PCC	POINT OF COMPOUND CURVE
PRC	POINT OF REVERSE CURVE
POB	POINT OF BEGINNING
POE	POINT OF ENDING
STA	STATION PREFIX
AH	AHEAD STATION SUFFIX
BK	BACK STATION SUFFIX
D	CURVE DEGREE OF (100FT)
R	CURVE RADIUS OF
T	CURVE TANGENT LENGTH
L	CURVE LENGTH OF
E	CURVE EXTERNAL DISTANCE

UTILITY SYMBOLOGY

UNDERGROUND UTILITIES

- UT — TELEPHONE
- UE — ELECTRIC
- UC — CABLE (TV)
- UEC — ELECTRIC+CABLE
- UET — ELECTRIC+TELEPHONE
- UCT — CABLE+TELEPHONE
- UECT — ELECTRIC+CABLE+TELEP.
- G — GAS LINE
- W — WATER LINE
- S — SANITARY SEWER (SEPTIC)

ABOVE GROUND UTILITIES (AERIAL)

- T — TELEPHONE
- E — ELECTRIC
- C — CABLE (TV)
- EC — ELECTRIC+CABLE
- ET — ELECTRIC+TELEPHONE
- AER E&T — ELECTRIC+TELEPHONE
- CT — CABLE+TELEPHONE
- ECT — ELECTRIC+CABLE+TELEP.
- UTILITY POLE GUY WIRE

PROJECT CONSTRUCTION SYMBOLOGY

PROJECT DESIGN & LAYOUT SYMBOLOGY

- CZ — CLEAR ZONE
- PLAN LAYOUT MATCHLINE

PROJECT CONSTRUCTION FEATURES

- TOP OF CUT SLOPE
- TOE OF FILL SLOPE
- STONE FILL
- BOTTOM OF DITCH ℄
- CULVERT PROPOSED
- STRUCTURE SUBSURFACE
- PDF — PROJECT DEMARCATION FENCE
- BF — BARRIER FENCE
- TREE PROTECTION ZONE (TPZ)
- STRIPING LINE REMOVAL
- SHEET PILES

CONVENTIONAL BOUNDARY SYMBOLOGY

BOUNDARY LINES

- TOWN LINE — TOWN BOUNDARY LINE
- COUNTY LINE — COUNTY BOUNDARY LINE
- STATE LINE — STATE BOUNDARY LINE
- PROPOSED STATE R.O.W. (LIMITED ACCESS)
- PROPOSED STATE R.O.W.
- STATE ROW (LIMITED ACCESS)
- STATE ROW
- TOWN ROW
- PERMANENT EASEMENT LINE (P)
- TEMPORARY EASEMENT LINE (T)
- SURVEY LINE
- P/L — PROPERTY LINE (P/L)
- SR SR SR — SLOPE RIGHTS
- 6F — 6F PROPERTY BOUNDARY
- 4F — 4F PROPERTY BOUNDARY
- HAZ — HAZ HAZARDOUS WASTE

EPSC LAYOUT PLAN SYMBOLOGY

EPSC MEASURES

- FILTER CURTAIN
- SILT FENCE
- SILT FENCE WOVEN WIRE
- CHECK DAM
- DISTURBED AREAS REQUIRING RE-VEGETATION
- EROSION MATTING

ENVIRONMENTAL RESOURCES

- WETLAND BOUNDARY
- RIPARIAN BUFFER ZONE
- WETLAND BUFFER ZONE
- SOIL TYPE BOUNDARY
- T&E — THREATENED & ENDANGERED SPECIES
- HAZ — HAZ — HAZARDOUS WASTE AREA
- AG — AGRICULTURAL LAND
- HABITAT — FISH & WILDLIFE HABITAT
- FLOOD PLAIN — FLOOD PLAIN
- OHW — ORDINARY HIGH WATER (OHW)
- STORM WATER
- USDA FOREST SERVICE LANDS
- WILDLIFE HABITAT SUIT/CONN

ARCHEOLOGICAL & HISTORIC

- ARCH — ARCHEOLOGICAL BOUNDARY
- HISTORIC DIST — HISTORIC DISTRICT BOUNDARY
- HISTORIC — HISTORIC AREA
- H — HISTORIC STRUCTURE

CONVENTIONAL TOPOGRAPHIC SYMBOLOGY

EXISTING FEATURES

- ROAD EDGE PAVEMENT
- ROAD EDGE GRAVEL
- DRIVEWAY EDGE
- DITCH
- FOUNDATION
- FENCE (EXISTING)
- FENCE WOOD POST
- FENCE STEEL POST
- GARDEN
- ROAD GUARDRAIL
- RAILROAD TRACKS
- CULVERT (EXISTING)
- STONE WALL
- WALL
- WOOD LINE
- BRUSH LINE
- HEDGE
- BODY OF WATER EDGE
- LEDGE EXPOSED

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106lgnd.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
CONVENTIONAL SYMBOLOGY LEGEND SHEET	SHEET 3 OF 45

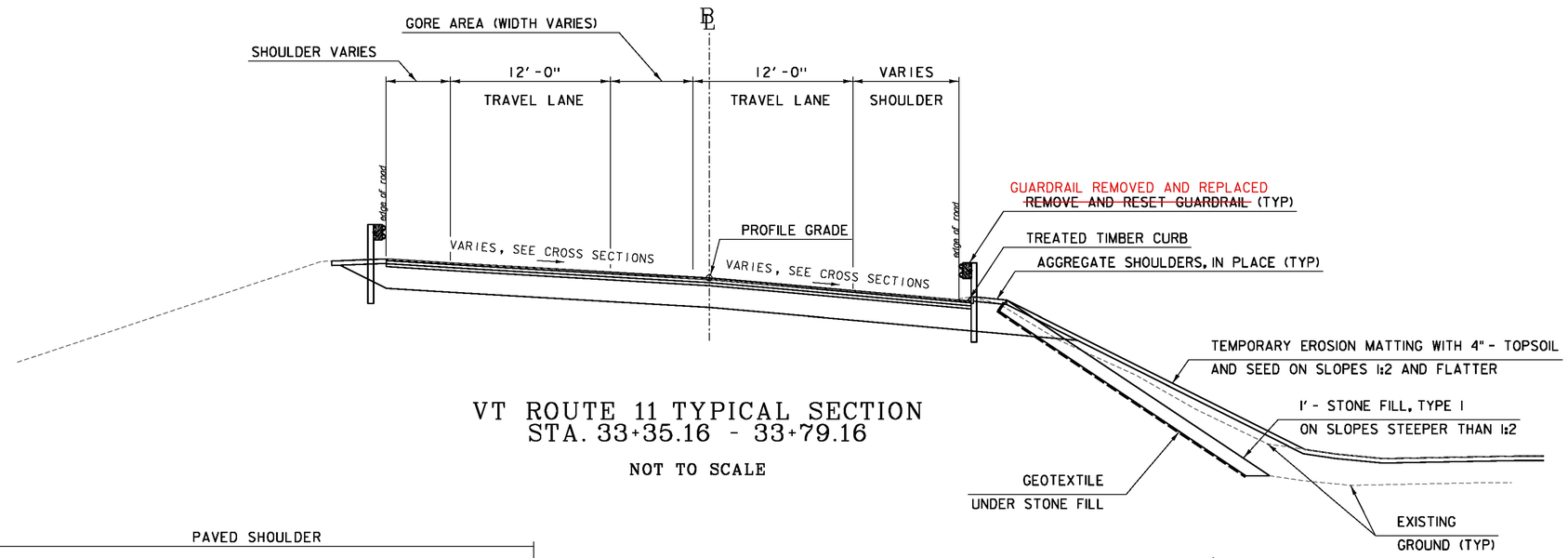
TYPICAL SECTIONS

MATERIAL ITEM	THICKNESS TOLERANCE
PAVEMENT (TOTAL DEPTH ALL LAYERS)	+/- 1/4"
SUBBASE (TOTAL DEPTH ALL LAYERS)	+/- 1"

VT ROUTE 11 FULL DEPTH RECONSTRUCTION:

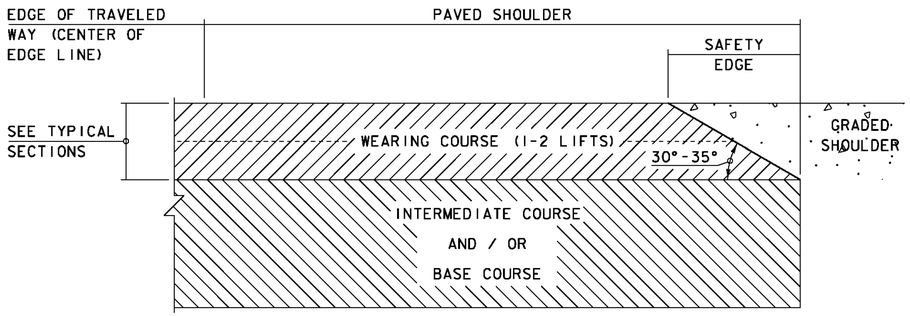
1 1/2" TYPE IVS - WEARING COURSE
3 1/2" TYPE IIS - INTERMEDIATE COURSE
3 1/2" TYPE IIS - BASE COURSE
24" SUBBASE OF DENSE GRADED CRUSHED STONE

TACK COAT: EMULSIFIED ASPHALT IS TO BE APPLIED AT THE RATE OF 0.025 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT AS DIRECTED BY THE ENGINEER.



VT ROUTE 11 TYPICAL SECTION
STA. 33+35.16 - 33+79.16

NOT TO SCALE

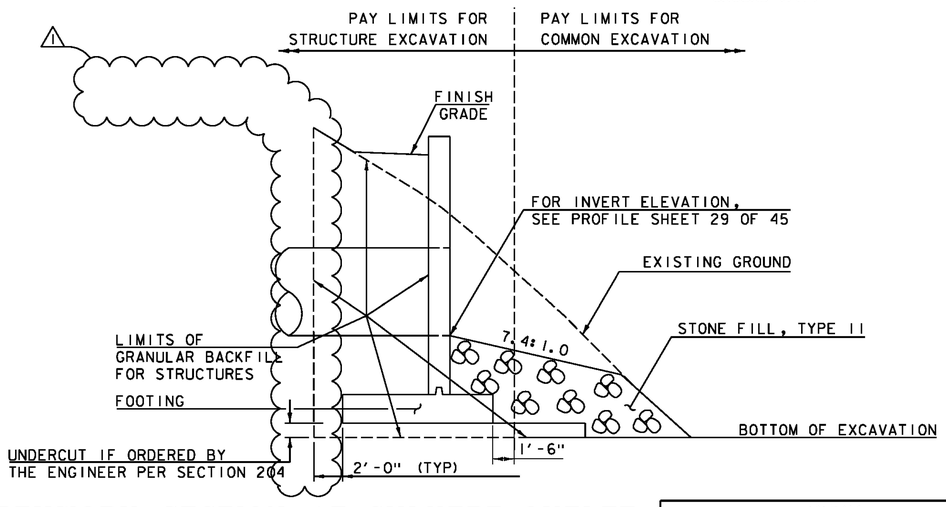


SAFETY EDGE DETAIL

NOT TO SCALE

1. THE EDGE OF PAVEMENT SHALL BE FORMED IN SUCH A WAY THAT THE BITUMINOUS CONCRETE PAVEMENT IS EXTRUDED OR COMPRESSED TO FORM THE 30 TO 35 DEGREE ANGLE. DEVICES THAT SIMPLY STRIKE-OFF THE MIX WITHOUT PROVIDING ANY COMPACTIVE EFFORT WILL NOT BE ALLOWED.

2. THE PAVED SHOULDER EXTENDS FROM THE EDGE OF TRAVELED WAY TO THE EDGE OF THE WEARING COURSE, INCLUDING THE "SAFETY EDGE".



EARTHWORK SECTION AT CULVERT OUTLET

NOT TO SCALE

REVISION	BY	DATE
⚠ DELETED REFERENCE TO TEMPORARY SUPPORT OF EXCAVATION	MAB	2/10/2015

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b1106typ.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
TYPICAL SECTION SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 4 OF 45

GENERAL:

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2012, AND ITS LATEST REVISIONS.

2. PRIOR TO ANY EARTH DISTURBANCE, INCLUDING BUT NOT LIMITED TO REMOVAL OF EXISTING CONCRETE PAVERS, THE CONTRACTOR SHALL PROVIDE TO THE ENGINEER PHOTOGRAPHS AND DOCUMENTATION OF EXISTING CONDITIONS.

3. THERE ARE EXISTING BELOW GRADE AND ABOVE GRADE, PRIVATELY OWNED, UTILITIES WITHIN THE PROJECT LIMITS. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY OF THESE UTILITIES.

CAST-IN-PLACE CONCRETE HEADWALL, WINGWALL AND FOOTING:

GENERAL

1. ALL CONCRETE SHALL BE CAST-IN-PLACE.

2. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

3. ALL HARDWARE SHALL BE STEEL.

4. ALL STEEL WITH THE EXCEPTION OF REINFORCING SHALL BE HOT DIPPED GALVANIZED.

CONCRETE AND REINFORCING STEEL

1. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES ON THE HEADWALL AND WINGWALLS. WATER REPELLENT, SILANE IS NOT NEEDED FOR OTHER CONCRETE ELEMENTS UNLESS DIRECTED BY THE ENGINEER.

2. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".

3. REINFORCING STEEL IN THE HEADWALL, WINGWALLS AND FOOTING SHALL MEET THE REQUIREMENTS OF SECTION 507 FOR UNCOATED LEVEL 1 REINFORCING STEEL.

4. ALL EXPOSED EDGES ON CONCRETE SHALL BE CHAMFERED 1" X 1".

5. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:
   - ALONG BACK FACES OF WALLS AGAINST EARTH - 2 INCHES
   - ELSEWHERE UNLESS OTHERWISE INDICATED - 3 INCHES

6. DESIGN VALUES
   a. HIGH PERFORMANCE CLASS B CONCRETE COMPRESSIVE STRENGTH: f'c = 3500 PSI.

SPECIAL PROVISION (STOP LOG SYSTEM):

1. ONCE THE PROJECT HAS BEEN COMPLETED, SPECIAL PROVISION (STOP LOG SYSTEM) WILL BE UTILIZED BY BROMLEY TO DIVERT WATER FLOW INTO AN EXISTING 42" DIVERSION PIPE. WATER WILL BE DIVERTED BY INSERTING 2" X 10" SELECT STRUCTURAL SOUTHERN PINE BOARDS INTO THE GALVANIZED STEEL CHANNEL THAT SHALL BE CONSTRUCTED AT THE FACE OF THE WINGWALL.

2. ALL MOUNTING HARDWARE NECESSARY TO INSTALL THE SPECIAL PROVISION (STOP LOG SYSTEM) SHALL BE CONSIDERED INCIDENTAL TO ITEM NUMBER 900.645 SPECIAL PROVISION (STOP LOG SYSTEM).

3. TIMBER FOR SPECIAL PROVISION (STOP LOG SYSTEM)
   a. TIMBER SHALL BE IN ACCORDANCE WITH AASHTO LRFD AND ANSI/AF&PA NDS, NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION WITH COMMENTARY AND NDS SUPPLEMENT-DESIGN VALUES FOR WOOD STRUCTURES LATEST EDITION AND THE USDA FOREST SERVICE TIMBER MANUAL.

   b. THE MAXIMUM ALLOWABLE MOISTURE CONTENT IS 19 PERCENT FOR ALL SAWN MEMBERS AT INSTALLATION.

   c. ALL LUMBER SHALL BE TREATED IN ACCORDANCE WITH AASHTO M133 AND AWPA STANDARD C14 WITH MATERIALS APPROVED BY THE ENGINEER.

   d. THE MINIMUM DESIGN VALUE OF SOUTHERN PINE SHALL BE:

      i. Ebo = 2.05 KSI ii. Eo = 1.600 KSI

TRAFFIC CONTROL:

SEE TRAFFIC CONTROL SHEETS FOR APPLICABLE TRAFFIC AND STAGING NOTES.

EPSC:

SEE EPSC SHEETS FOR APPLICABLE EPSC NOTES.

UTILITIES:

1. THE WEEK OF 10/07/2013 TO 10/11/2013 BSI ENGINEERING PERFORMED TRACING AND EXPLORATORY TEST PITS TO DETERMINE THE LOCATION AND DEPTHS OF EXISTING UTILITIES ALONG THE PROPOSED CULVERT ALIGNMENT. THE RESULTS HAVE BEEN PLOTTED ONTO THE BASEMAP.

2. UNLESS OTHERWISE NOTED ON THE PLANS, ALL UTILITIES HAVE BEEN PLOTTED TO QUALITY LEVEL "C"; SEE BELOW.

3. UTILITY QUALITY LEVEL INFORMATION INDEX (SEE ASCE/CI 38-02):

   UTILITY QUALITY LEVEL (QL-A):
   PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT. MINIMALLY INTRUSIVE EXCAVATION EQUIPMENT IS TYPICALLY USED TO MINIMIZE THE POTENTIAL FOR UTILITY DAMAGE. A PRECISE HORIZONTAL AND VERTICAL LOCATION, AS WELL AS OTHER UTILITY ATTRIBUTES, IS SHOWN ON PLAN DOCUMENTS. ACCURACY IS TYPICALLY SET TO 0.05 FEET (15-MM) VERTICAL AND TO APPLICABLE HORIZONTAL SURVEY AND MAPPING ACCURACY AS DEFINED OR EXPECTED BY THE PROJECT OWNER. INFORMATION IS ONLY VALID WITHIN THE VISIBLE LIMITS OF THE TEST HOLE.

   UTILITY QUALITY LEVEL (QL-B):
   INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

   UTILITY QUALITY LEVEL (QL-C):
   INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

   UTILITY QUALITY LEVEL (QL-D):
   INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

4. EXISTING BROMLEY OWNED WATER AND SEWER LINES EXIST AND WILL BE REQUIRED TO BE SUPPORTED AND/OR BYPASSED DURING CONSTRUCTION OF THIS PROJECT AS SPECIFIED ON THE PLANS OR AS DIRECTED BY THE ENGINEER. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTIONS 628 AND 629 OF THE STANDARD SPECIFICATIONS AND AS DIRECTED BY THE ENGINEER.

5. SEE THE UTILITIES SECTION OF THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS

PARKING LOT RESTORATION:

1. ANY AREA OF THE PARKING LOT DAMAGED BY THE CONTRACTOR SHALL BE RESTORED TO THE SATISFACTION OF THE ENGINEER BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE STATE.

2. PARKING LOT PATCHING SHALL BE AS SPECIFIED IN THE TRENCH DETAIL.

3. ALL PARKING LOT STRIPING SHALL BE REPLACED AS SPECIFIED ON THE TRAFFIC SIGNS AND MARKING SHEET.

PIPE INSTALLATION:

1. THE CONTRACTOR SHALL NOTIFY BROMLEY MOUNTAIN SKI RESORT (BROMLEY) AT LEAST 30-DAYS PRIOR TO COMMENCING WITH ANY WORK WITHIN THE NON-PARTICIPATING AREA SO THAT BROMLEY CAN REMOVE ALL MINIATURE GOLF FEATURES. BROMLEY WILL RESTORE THE MINIATURE GOLF FEATURES AT THE COMPLETION OF CONSTRUCTION.

2. STANDARD PIPE LENGTHS OF THE 72" PIPE SHALL BE A MINIMUM OF 20-FEET. ALL JOINTS SHALL BE RUBBER GASKETED, AND NO JOINT SHALL BE LOCATED WITHIN 10-FEET OF THE SKI RESORT BUILDING CORNER AT STA. 13+91

3. THE CONTRACTOR SHALL TAKE NOTE THAT TEMPORARY SUPPORT OF EXCAVATION IS ANTICIPATED TO BE REQUIRED TO COMPLETE THE WORK UNDER THIS CONTRACT. SPECIAL PRECAUTIONS SHALL BE TAKEN WHEN EXCAVATING IN THE VICINITY OF THE SKI LIFT TOWER #1 (TOWER #1) FOUNDATION AND THE BROMLEY BUILDING. THE USE OF TRENCH BOXES FOR TEMPORARY SUPPORT OF EXCAVATION WITHIN 30-FEET OF THE BROMLEY BUILDING CORNER AND TOWER #1 FOUNDATION IS PROHIBITED.

4. THE CONTRACTOR SHALL SUBMIT CONSTRUCTION DRAWINGS FOR THE ENGINEER'S APPROVAL AT LEAST 30 DAYS PRIOR TO THE ANTICIPATED START OF ANY WORK WITHIN 30-FEET OF THE BUILDING CORNER AND TOWER #1 FOUNDATION. IN ADDITION TO THE REQUIREMENTS SET FORTH UNDER SECTIONS 105 AND 204, THE CONSTRUCTION DRAWINGS SHALL DETAIL THE PROPOSED METHOD FOR EXCAVATION SUPPORT WITHIN 30-FEET OF THE BUILDING CORNER AND TOWER #1 FOUNDATION, PROCEDURE FOR PERFORMING A PRE- AND POST-CONSTRUCTION SURVEY AND PROCEDURES FOR SETTLEMENT AND VIBRATION MONITORING AS DISCUSSED FURTHER BELOW. THE SUPPORT OF EXCAVATION WITHIN THE AREA OF THE BUILDING CORNER AND TOWER #1 FOUNDATION SHALL MEET THE FOLLOWING CRITERIA:

   a. THE SUPPORT OF EXCAVATION WITHIN 15-FEET OF THE TOWER #1 FOUNDATION AND THE BUILDING SHALL BE LEFT IN PLACE WHERE SHOWN ON THE PLANS. THE TOP OF THE SUPPORT OF EXCAVATION ELEVATION SHALL BE NO LOWER THAN 12-INCHES ABOVE THE TOP OF THE TOWER #1 FOOTING (SEE SHEET 29) OR THE TOP OF THE BUILDING FOOTING (THE BUILDING HAS A WALKOUT BASEMENT AND THE TOP OF FOOTING ELEVATION IS NOT KNOWN, BUT CAN BE APPROXIMATED TO BE AT ELEVATION 1993)
   b. NO WOOD PRODUCTS SHALL BE ALLOWED FOR THE EXCAVATION SUPPORT TO BE LEFT IN PLACE.
   c. SUPPORT OF EXCAVATION SYSTEMS MAY INCLUDE BUT ARE NOT LIMITED TO STEEL SHEETING, SOLDIER PILE AND LAGGING (WOOD LAGGING IS PROHIBITED), AND BUILDING UNDER PINNING.
   d. THE BUILDING LOAD AT THE BUILDING FOOTING IS 3.6 KIPS/LF. TEMPORARY SUPPORT OF EXCAVATION DESIGN SHALL ACCOUNT FOR THIS ADDITIONAL LOAD.
   e. SETTLEMENT AND VIBRATION MONITORING SHALL BE PROVIDED AS DISCUSSED BELOW.

   THE COST OF ALL EXCAVATION SUPPORT SHALL BE CONSIDERED INCIDENTAL TO ITEM 204.25 STRUCTURE EXCAVATION.

5. IN THE VICINITY OF THE BUILDING AND TOWER #1 FOUNDATION AS SHOWN ON THE PLANS OR AS OTHERWISE DIRECTED BY THE ENGINEER, THE PIPE TRENCH SHALL BE BACKFILLED USING CONTROLLED DENSITY (FLOWABLE) FILL MEETING THE MATERIAL REQUIREMENTS OF CONTROLLED DENSITY (FLOWABLE) FILL PROVIDED BELOW. BACKFILL THE 72" PIPE TRENCH WITH CONTROLLED DENSITY (FLOWABLE) FILL IN ACCORDANCE WITH THE DETAIL ON SHEET 7 TO THE LIMITS OF THE EXCAVATION SUPPORT TO BE LEFT IN PLACE. BACKFILL THE 12" PIPE TRENCH IN ACCORDANCE WITH THE PLANS. THE CONTRACTOR SHALL RESTRAIN THE PIPES TO RESIST BUOYANCY WHEN BACKFILLING THE TRENCH. THE COST FOR THE CONTROLLED DENSITY (FLOWABLE) FILL SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 541.45 CONTROLLED DENSITY (FLOWABLE) FILL.

CLASS	MINIMUM CEMENT (LBS/CY)	MAX WATER-CEMENT RATIO	RANGE IN SLUMP (IN)	AIR CONTENT (%)	COARSE AGGREGATE TABLE	28-DAY COMP. STRENGTH (PSI)
CONTROLLED DENSITY (FLOWABLE) FILL	100 & 300 LBS OF *FLY ASH, CLASS F	3	8 MIN.	10 MIN.	704.01 (FINE AGGREGATE)	125 MAX.

6. A PRE-CONSTRUCTION SURVEY OF THE SKI RESORT BUILDING AND SKI LIFT TOWER #1 FOUNDATION SHALL BE CONDUCTED AND SHALL INCLUDE:
   a. VIDEOS, PHOTOGRAPHS, AND A LEVEL SURVEY GIVING ELEVATIONS (ON THE PROJECT DATUM) OF SPECIFIC LOCATIONS WHICH SHALL BE NOTED ON PRINTS SUBMITTED TO THE ENGINEER. A SURVEY BENCHMARK SHALL BE ESTABLISHED ON TOWER #1 AND AT LEAST AT FIVE APPROVED LOCATIONS ALONG THE BUILDING FOUNDATION WALL: THE SOUTHWEST CORNER OF THE BUILDING FOUNDATION, AT 10-FEET AND 20-FEET NORTHERLY ALONG THE BUILDING FOUNDATION, THE BULKHEAD FOUNDATION, AND 20-FEET EASTERLY ALONG THE BUILDING FOUNDATION.
   b. ALL SURVEYS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER AND PROPERTY OWNER OR THEIR DESIGNEE.
   c. NOTATION AND MEASUREMENTS OF ANY EXISTING ARCHITECTURAL, STRUCTURAL, COSMETIC, PLUMBING OR ELECTRICAL DAMAGE OR ANY OTHER DAMAGE.
   d. DOCUMENTATION OF ANY VIBRATION OR MOVEMENT SENSITIVE EQUIPMENT.
   e. WHERE BUILDING STRUCTURAL ELEMENTS AND ALL RELATED ARCHITECTURAL AND BUILDING FACILITIES ARE INVOLVED, A STATE OF VERMONT LICENSED STRUCTURAL ENGINEER SHALL BE IN RESPONSIBLE CHARGE OF THE SURVEY.
   f. ALL DOCUMENTATION FROM THE PRE-CONSTRUCTION SURVEY SHALL BE PROVIDED TO THE ENGINEER AT LEAST 30 DAYS PRIOR TO BEGINNING ANY EXCAVATION WORK WITHIN 30-FEET OF THESE STRUCTURES.

   THE COST OF THE PRE-CONSTRUCTION SURVEY SHALL BE CONSIDERED INCIDENTAL TO ITEM 204.25 STRUCTURE EXCAVATION.

REVISION	BY	DATE
⚠1 NOTE 4a REVISED	MAB	2/10/2015

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106det.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: B. KHALIFA
PROJECT NOTES SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: B. KHALIFA
SHEET 5 OF 45

PIPE INSTALLATION (CONTINUED):

7. A CORRECTIVE ACTION PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL A MINIMUM OF 21-DAYS PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITIES WITHIN 30-FEET OF THE TOWER #1 FOUNDATION AND THE BUILDING. THE CORRECTIVE ACTION PLAN SHALL INCLUDE, AT A MINIMUM, MEASURES TO STOP ANY MOVEMENT AND RESTORE ANY AREA DAMAGED BY MOVEMENT OR VIBRATION WHICH EXCEEDED THE ALLOWABLE THRESHOLDS PROVIDED BELOW. THE COST FOR THE PREPARATION AND EXECUTION OF THE CORRECTIVE ACTION PLAN SHALL BE CONSIDERED INCIDENTAL TO ITEM 204.25 STRUCTURE EXCAVATION UNLESS OTHERWISE NOTED IN NOTE 8.

8. THE MAXIMUM ALLOWABLE HORIZONTAL OR VERTICAL MOVEMENT OF THE TOWER #1 FOUNDATION OR THE BUILDING IS 0.25-INCHES. THE MAXIMUM LATERAL MOVEMENT OF THE EXCAVATION SUPPORT AT THE TOWER #1 AND BUILDING LOCATION SHALL BE LIMITED TO 0.50 INCHES. THE CONTRACTOR SHALL MONITOR AND MEASURE THE MOVEMENTS OF THE EXCAVATION SUPPORT, TOWER #1 FOUNDATION AND THE BUILDING DURING EXCAVATION ACTIVITIES EVERY 2-FEET OF EXCAVATED DEPTH UNTIL THE BOTTOM OF EXCAVATION IS REACHED; DAILY THEREAFTER FOR A PERIOD OF 1 MONTH AFTER THE EXCAVATION HAS BEEN BACKFILLED. THE CONTRACTOR SHALL ESTABLISH AT LEAST FIVE MONITORING LOCATIONS ALONG THE FACE OF THE EXCAVATION SUPPORT ALONG THE TOP AND THEN IN THE VERTICAL DIRECTION AS THE EXCAVATION PROGRESSES DEEPER TO CREATE A 5X5 ARRAY OF MEASUREMENT POINTS WHEN FULLY EXCAVATED. THE MONITORING LOCATIONS FOR TOWER #1 AND THE BUILDING SHALL BE AS DESCRIBED IN NOTE 6 ABOVE.

   THE CONTRACTOR SHALL IMMEDIATELY STOP WORK AND NOTIFY THE ENGINEER OF ANY MOVEMENTS. IF THE ENGINEER DETERMINES THAT THE MOVEMENTS EXCEED THOSE SPECIFIED AND REQUIRE CORRECTIVE ACTION, THE CONTRACTOR SHALL TAKE CORRECTIVE ACTIONS NECESSARY TO STOP THE MOVEMENT AND PERFORM REPAIRS. WHEN DUE TO THE CONTRACTOR'S METHODS OR OPERATIONS OR FAILURE TO FOLLOW THE SPECIFIED/APPROVED CONSTRUCTION SEQUENCE, AS DETERMINED BY THE ENGINEER, THE COSTS OF PROVIDING CORRECTIVE ACTIONS SHALL BE BORNE BY THE CONTRACTOR. WHEN DUE TO DIFFERING SITE CONDITIONS, AS DETERMINED BY THE ENGINEER, THE COSTS OF PROVIDING CORRECTIVE ACTIONS SHALL BE PAID AS EXTRA WORK.

9. THE CONTRACTOR SHALL MONITOR VIBRATIONS WITH AN APPROVED SEISMOGRAPH(S) LOCATED, AS APPROVED, BETWEEN THE WORK AREA AND THE CLOSEST STRUCTURE SUBJECT TO VIBRATION DAMAGE. THE SEISMOGRAPH USED SHALL BE CAPABLE OF RECORDING PARTICLE VELOCITY FOR THREE MUTUALLY PERPENDICULAR COMPONENTS OF VIBRATION IN THE FREQUENCY RANGE GENERALLY FOUND WITH CONSTRUCTION ACTIVITIES GENERATING VIBRATIONS SUCH AS COMPACTING, SHEET PILING, ETC. THE VIBRATION MONITORING EQUIPMENT SHALL HAVE A SAMPLING RATE SUFFICIENT TO ACCURATELY RECORD HIGH FREQUENCY VIBRATIONS CLOSE TO THE WORK AREA. THE COST FOR ALL VIBRATION MONITORING SHALL BE CONSIDERED INCIDENTAL TO ITEM 204.25 STRUCTURE EXCAVATION.

   PEAK PARTICLE VELOCITY OF EACH COMPONENT SHALL NOT BE ALLOWED TO EXCEED THE SAFE LIMITS OF THE NEAREST STRUCTURE SUBJECT TO VIBRATION DAMAGE. SAFE VIBRATION LIMITS WILL BE CONSIDERED THOSE SHOWN IN TABLE 1, UNLESS THE CONTRACTOR PROVIDES EVIDENCE, TO THE ENGINEER'S SATISFACTION, THAT DIFFERENT LIMITS SHOULD BE USED. DATA RECORDED FOR ALL SHOTS SHALL BE FURNISHED TO THE ENGINEER, AND SHALL INCLUDE THE FOLLOWING:

- IDENTIFICATION OF INSTRUMENT USED.
- NAME OF QUALIFIED OBSERVER AND INTERPRETER.
- DISTANCE AND DIRECTION OF RECORDING STATION FROM WORK AREA.
- TYPE OF GROUND AT RECORDING STATION AND MATERIAL ON WHICH THE INSTRUMENT IS SITTING.
- MAXIMUM PARTICLE VELOCITY IN EACH COMPONENT.
- MAXIMUM DYNAMIC GROUND DISPLACEMENT.
- A DATED AND SIGNED COPY OF PHOTOGRAPHIC RECORDS OF SEISMOGRAPH READINGS.

TABLE 1

STRUCTURE TYPE	MAXIMUM ALLOWABLE PEAK PARTICLE VELOCITY (PPV) (1)	MAXIMUM DYNAMIC GROUND DISPLACEMENT (2)
STANDARD CONSTRUCTION TIMBER FRAME, BRICK AND CONCRETE BUILDINGS	50 MM/SEC (2.0 IN/SEC)	2 MM
REINFORCED CONCRETE STRUCTURES	100 MM/SEC (4.0 IN/SEC)	2 MM
STEEL STRUCTURES	100 MM/SEC (4.0 IN/SEC)	2 MM
BURIED UTILITIES/WELLS	50 MM/SEC (2.0 IN/SEC)	2 MM
GREEN CONCRETE	DEPENDS ON STRENGTH OF CONCRETE AND AS APPROVED BY ENGINEER	DEPENDS ON STRENGTH OF CONCRETE AND AS APPROVED BY ENGINEER

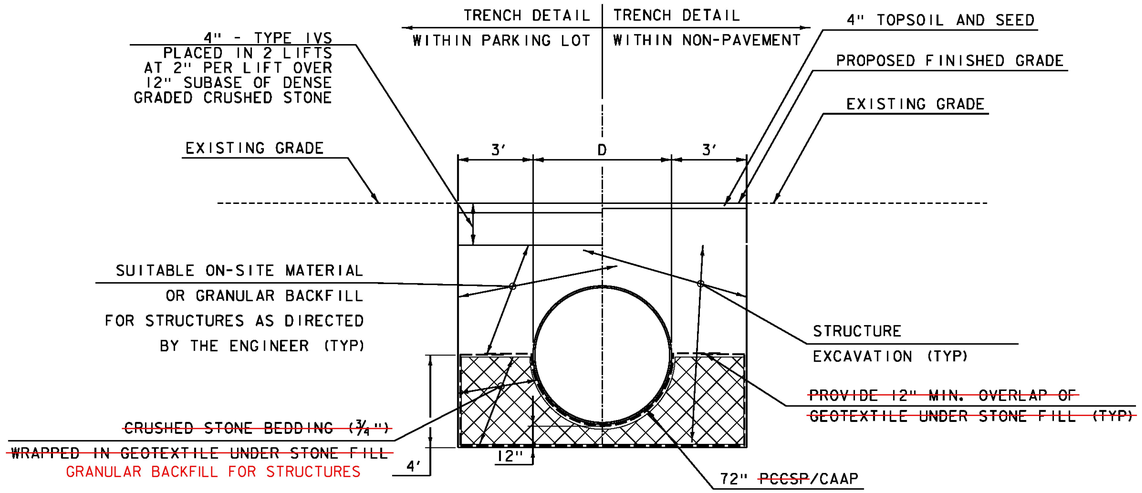
NOTES:

1. MAXIMUM PPV SHALL BE THE MAXIMUM OF THREE COMPONENTS MEASURED IN THREE MUTUALLY PERPENDICULAR DIRECTIONS (TRANSVERSE, VERTICAL AND LONGITUDINAL). THE CONTRACTOR SHALL MONITOR VIBRATIONS AT THE NEAREST STRUCTURE FOR ALL CONSTRUCTION ACTIVITIES GENERATING VIBRATIONS AND OTHER SENSITIVE STRUCTURES AS DESIGNATED BY ENGINEER.
2. DYNAMIC GROUND DISPLACEMENT EVALUATED ASSUMING SINUSOIDAL WAVE PATTERN AND USING THE FOLLOWING FORMULA:

$D = PPV/2\pi F$ - WHERE: D = DISPLACEMENT (MM);
PPV = PEAK PARTICLE VELOCITY (MM/SECOND) AND;
F = FREQUENCY (HZ)

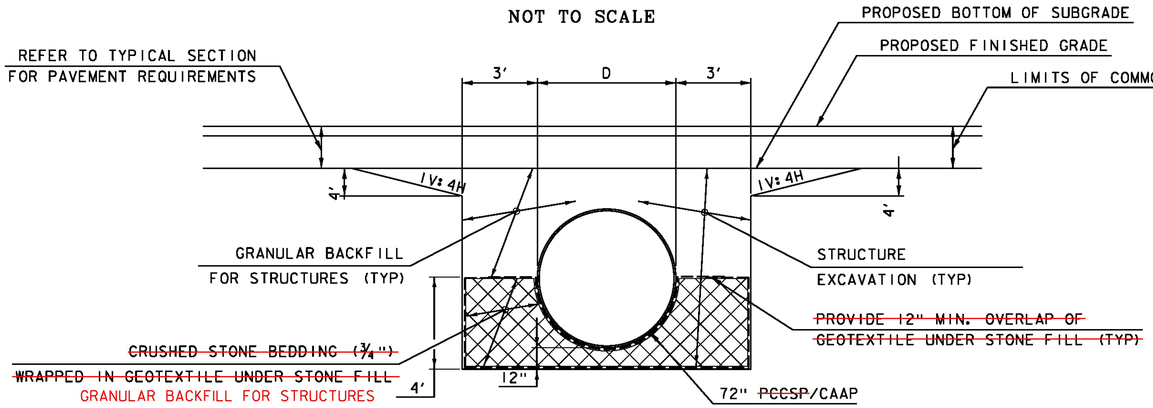
10. THE CONTRACTOR SHALL REPORT ALL RESULTS OF THE VIBRATION AND EXCAVATION SUPPORT, TOWER #1 FOUNDATION AND BUILDING MOVEMENT MONITORING TO THE ENGINEER IN WRITING DAILY.

11. AT THE COMPLETION OF THE CONSTRUCTION ACTIVITIES WITHIN 30-FEET OF THE TOWER #1 FOUNDATION AND THE BUILDING A POST-CONSTRUCTION SURVEY SHALL BE CONDUCTED THAT MEETS ALL OF THE CRITERIA FROM THE PRE-CONSTRUCTION SURVEY FOR THE TOWER AND BUILDING. THE CONTRACTOR SHALL CONTINUE TO MONITOR THE ESTABLISHED BENCHES FOR MOVEMENT 1-MONTH AFTER THE COMPLETION OF THE CONSTRUCTION ACTIVITIES WITHIN 30-FEET OF THE TOWER #1 FOUNDATION AND THE BUILDING. AFTER 1-MONTH OF ADDITIONAL MOVEMENT MONITORING THE CONTRACTOR SHALL SUBMIT WRITTEN DOCUMENTATION OF THE MOVEMENT, IF ANY, TO THE ENGINEER. THE COST OF POST-CONSTRICTION SURVEY AND REPORTING SHALL BE CONSIDERED INCIDENTAL TO ITEM 204.25 STRUCTURE EXCAVATION.



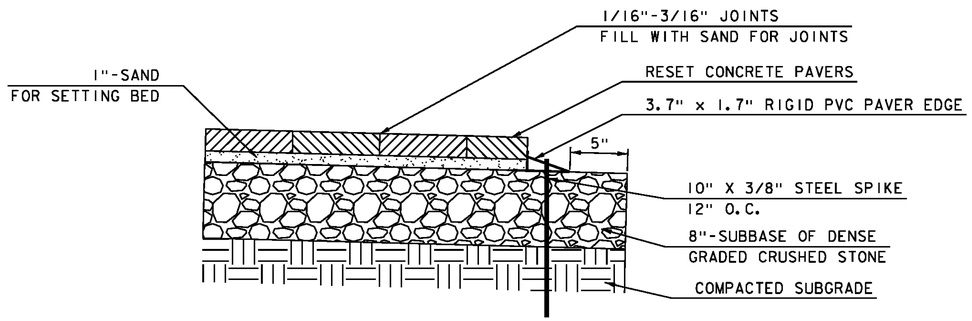
TYPICAL TRENCH DETAIL FOR 72" ~~PCCSP~~/CAAP PIPE

NOT TO SCALE



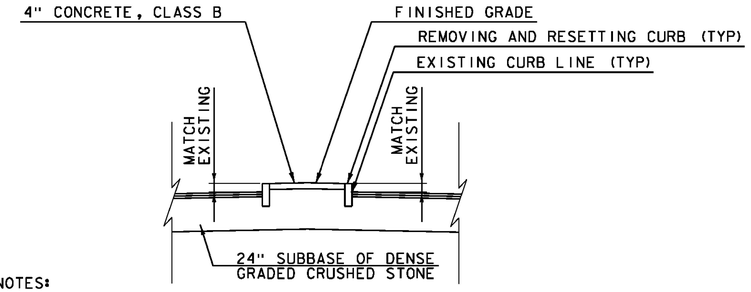
TYPICAL TRENCH DETAIL FOR 72" ~~PCCSP~~/CAAP PIPE
WITHIN VT ROUTE 11

NOT TO SCALE



SPECIAL PROVISION (REMOVE AND
RESET CONCRETE PAVERS)

NOT TO SCALE

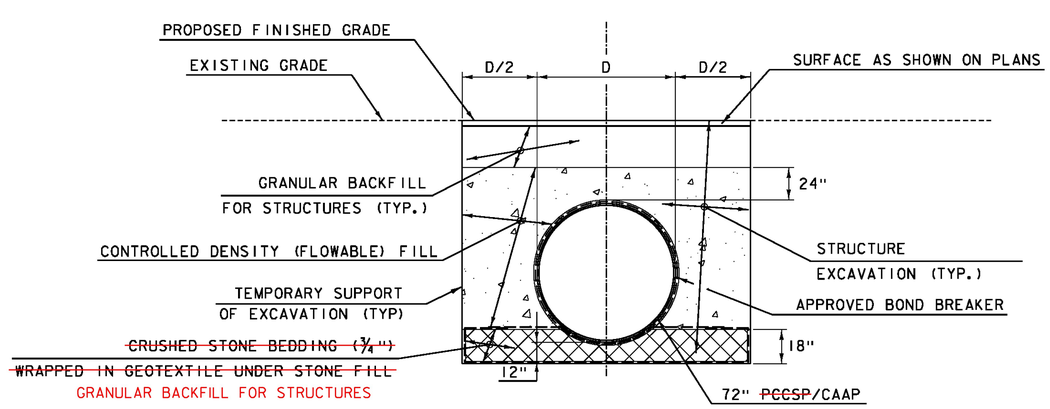


NOTES:

PAYMENT FOR FURNISHING, GRADING AND PLACING THE CONCRETE FOR THE MEDIAN ISLAND WILL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.675 SPECIAL PROVISION (PORTLAND CEMENT CONCRETE ISLAND TREATMENT, 4 INCH.)

SPECIAL PROVISION
(PORTLAND CEMENT CONCRETE ISLAND
TREATMENT, 4-INCH)

NOT TO SCALE

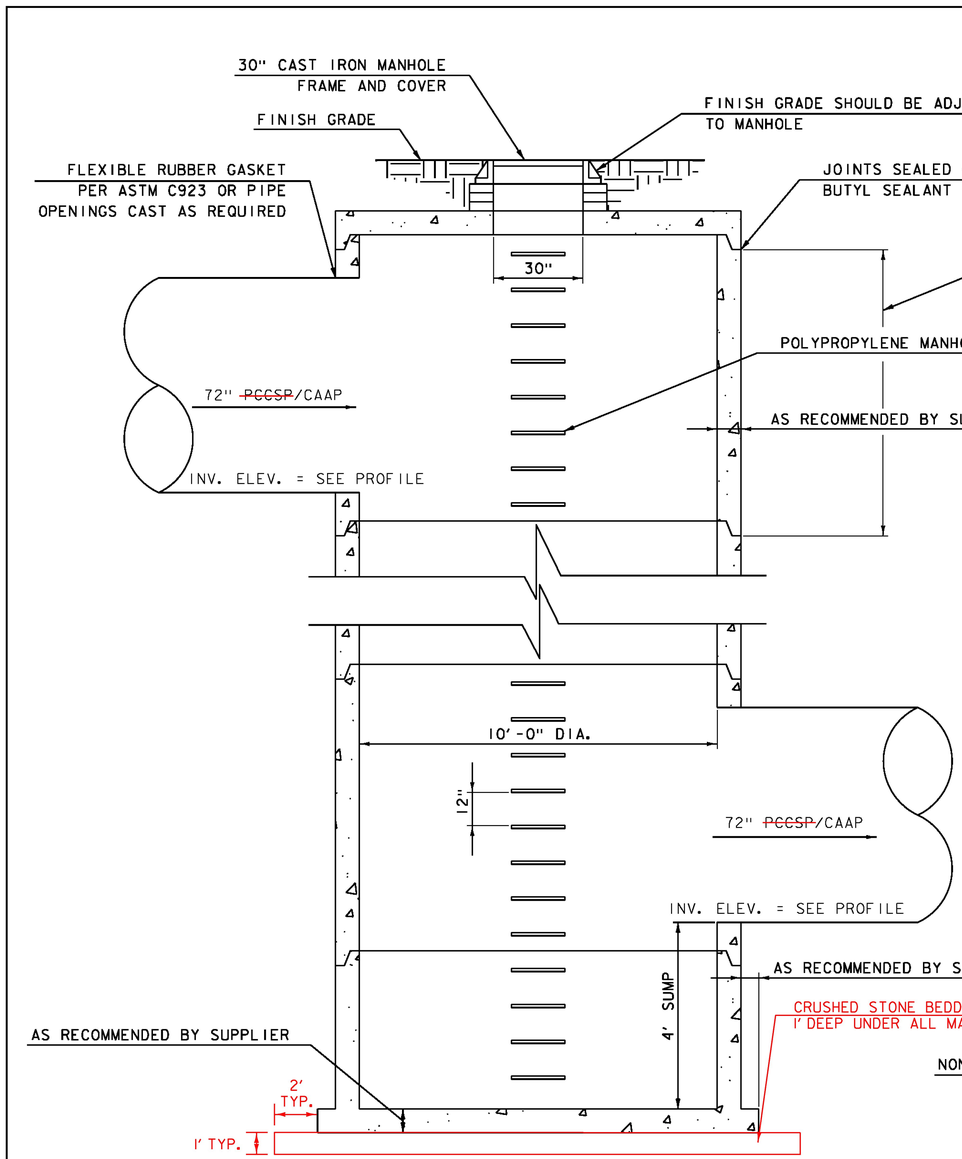


TYPICAL TRENCH DETAIL FOR 72" ~~PCCSP~~/CAAP
WITH CONTROLLED DENSITY (FLOWABLE) FILL

NOT TO SCALE

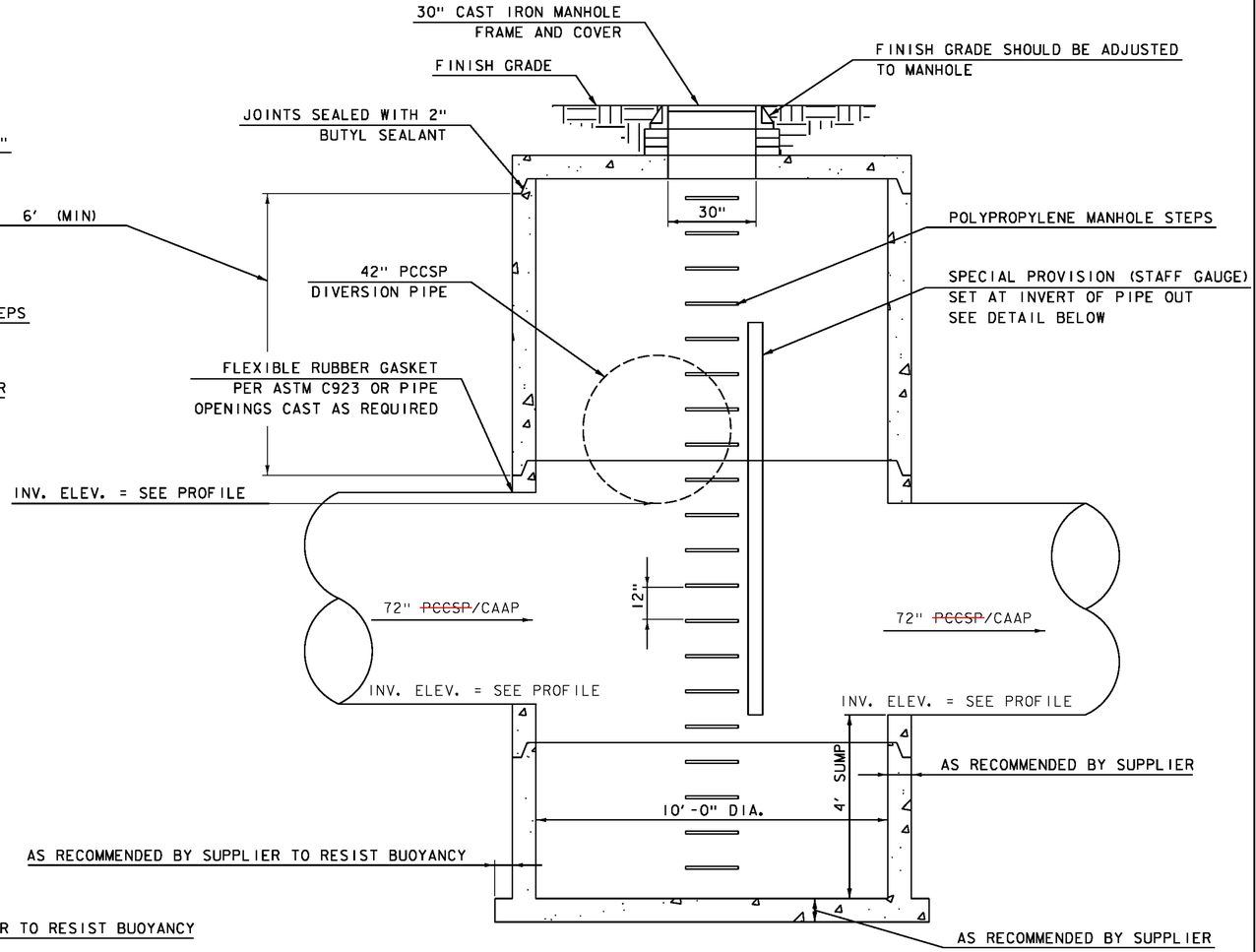
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07bl06det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
DETAIL SHEET 1	SHEET 7 OF 45



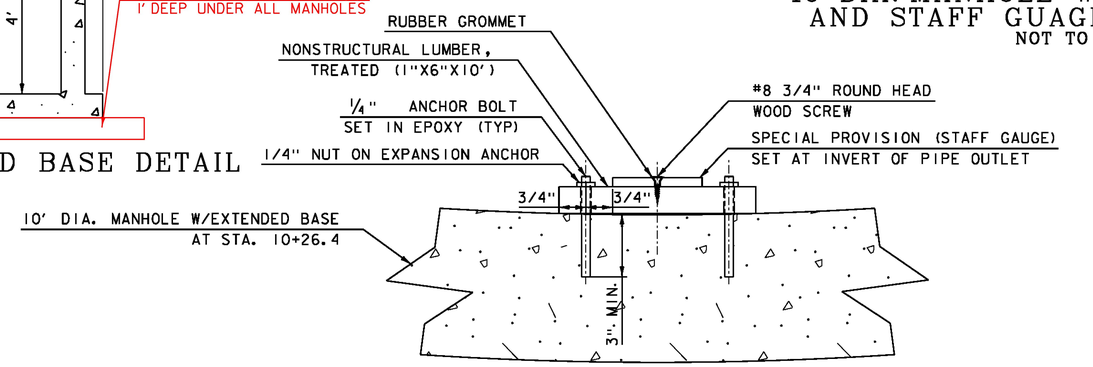
10' DIA. MANHOLE W/ EXTENDED BASE DETAIL

NOT TO SCALE



10' DIA. MANHOLE W/ EXTENDED BASE
AND STAFF GUAGE AT STA. 10+26.4

NOT TO SCALE

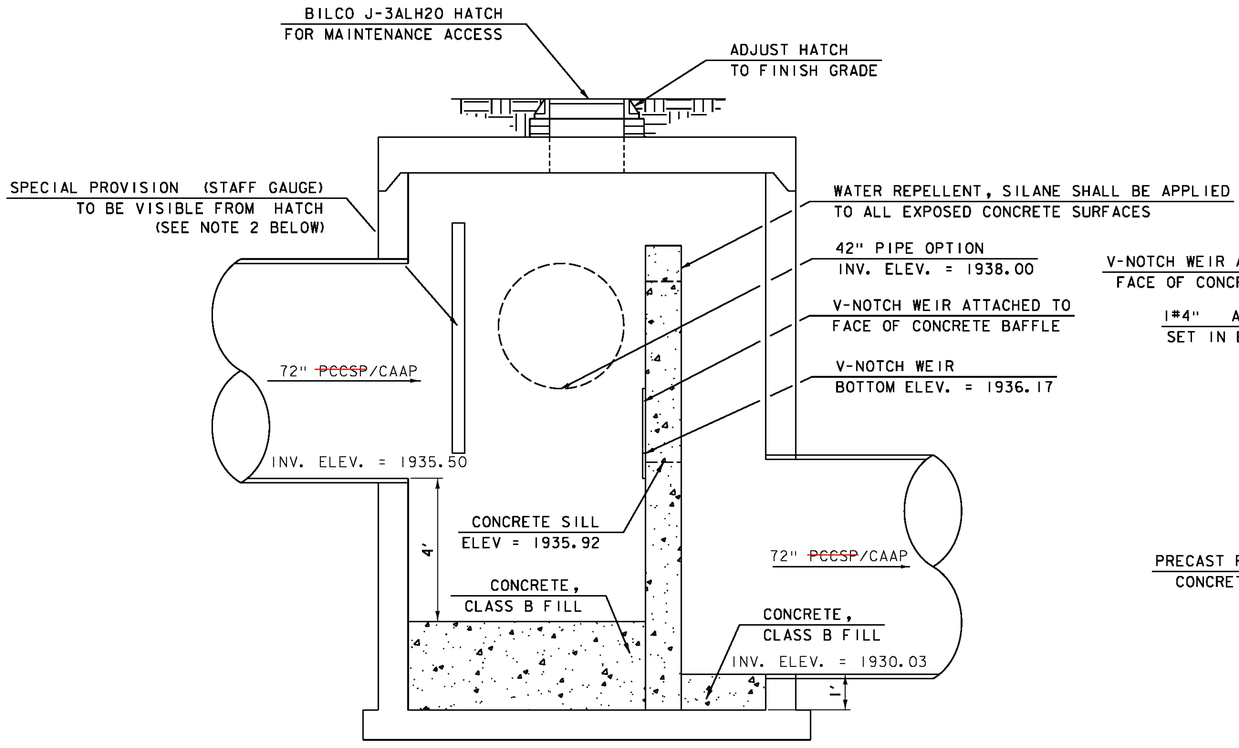


SPECIAL PROVISION (STAFF GAUGE) MOUNTING DETAIL

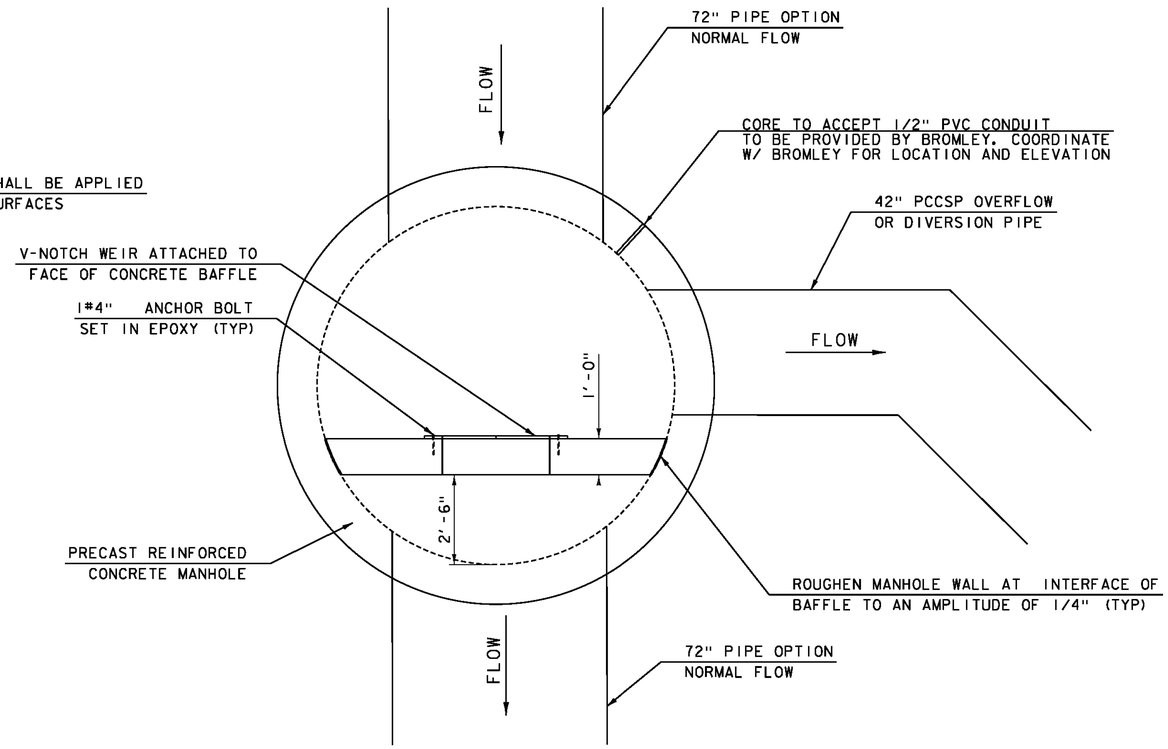
NOT TO SCALE

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
DETAIL SHEET 2	SHEET 8 OF 45

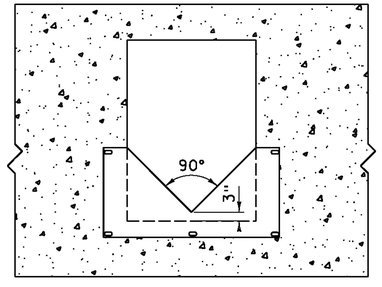
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS



10' DIA. MANHOLE W/ EXTENDED BASE, BAFFLE AND STAFF GUAGE AT STA. 10+26.4
NOT TO SCALE



PLAN
NOT TO SCALE



BAFFLE CUTOUT DETAIL
NOT TO SCALE

NOTES:

1.) STEPS SHALL BE INCLUDED INSIDE THE MANHOLE AND SHALL BE POSITIONED BELOW THE ACCESS HATCH

2.) SET "0.00" AT ELEVATION 1936.17 (BOTTOM OF V-NOTCH WEIR)

3.) PIPES SHALL RUN AT 0.4%, THE CORRESPONDING OUTLET ELEVATION FOR THE STRUCTURE LOCATED AT 10+50.68 IS 1935.56

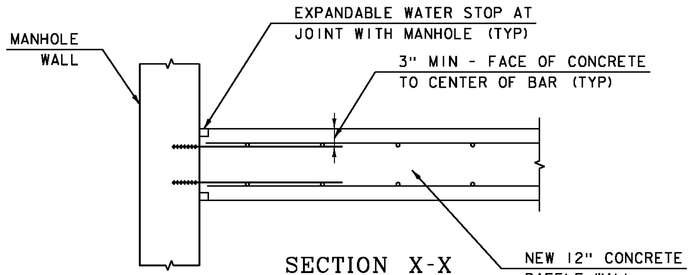
ADDED SHEET
STR #1 DETAILS

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

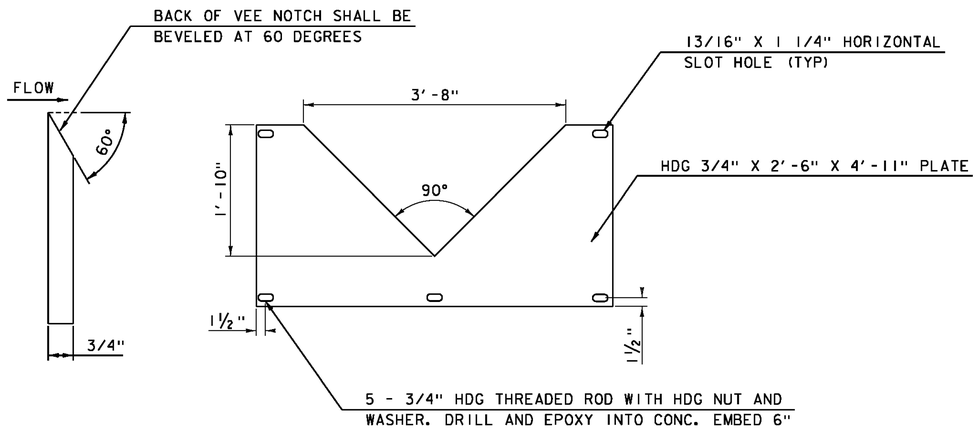
PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07bl06det.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
CHANGE DETAIL #1

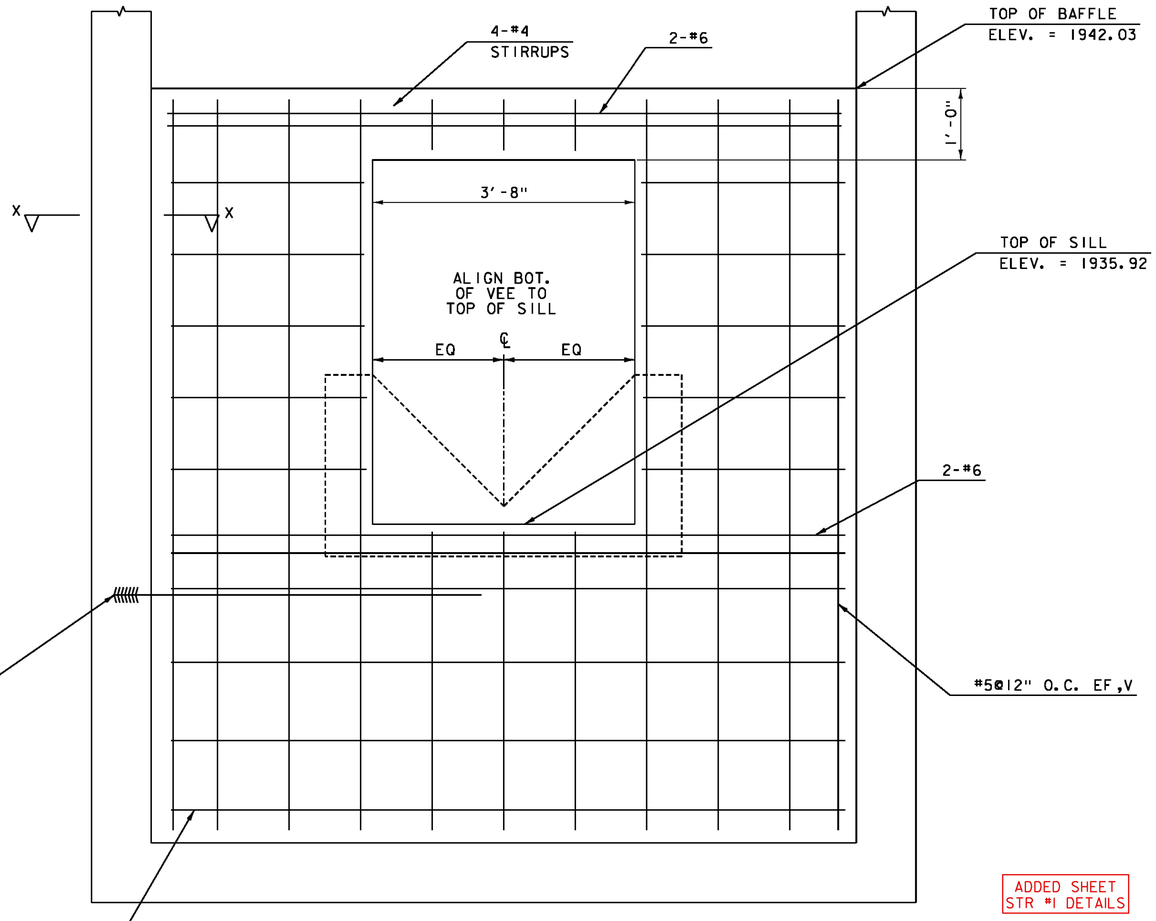
PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET +8A OF ~~245~~



SECTION X-X
NOT TO SCALE



WEIR DETAIL
NOT TO SCALE



BAFFLE ELEVATION
NOT TO SCALE

NOTES:

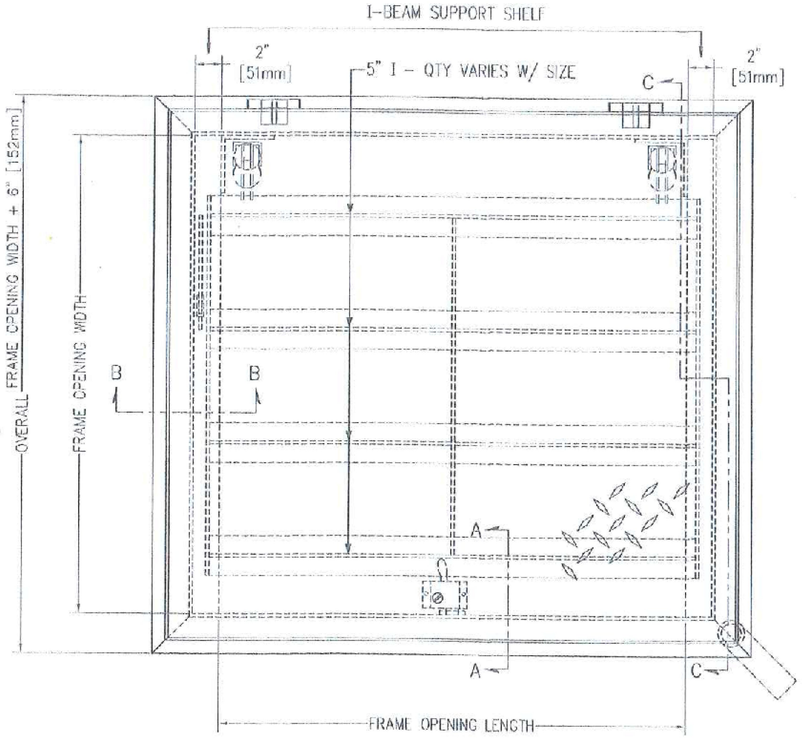
1.) CONCRETE AND REINFORCING STEEL FOR THE BAFFLE SHALL MEET THE REQUIREMENTS OF SHEET 5 OF THE CONCRACT PLANS

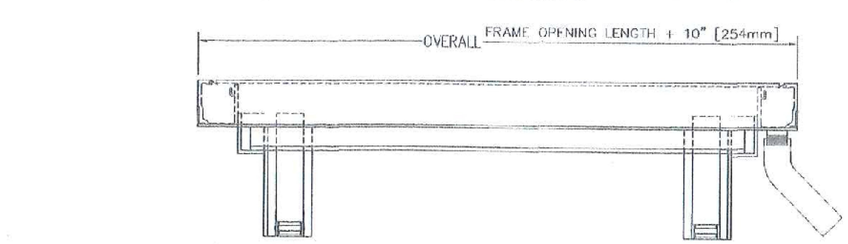
2.) HDG = HOT DIPPED GALVANIZED

ADDED SHEET
STR #1 DETAILS

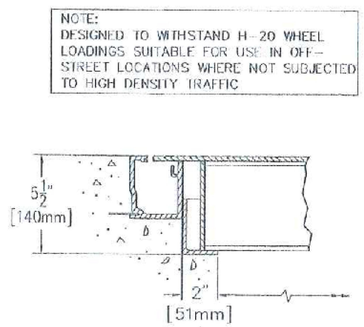
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
CHANGE DETAIL #2	SHEET ~~28~~ 8 OF ~~2~~ 45

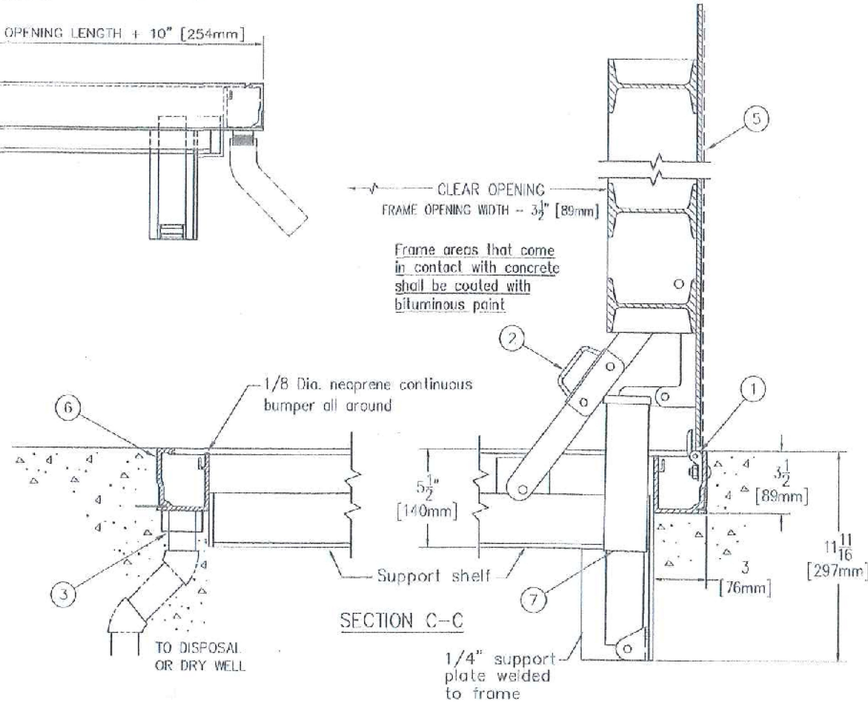




SECTION A-A



SECTION B-B



SECTION C-C

THIS DRAWING IS THE PROPERTY OF THE BILCO COMPANY AND INCORPORATES INFORMATION WHICH IS PROPRIETARY. PUBLICATION AND/OR PUBLIC DISTRIBUTION IN WHOLE OR IN PART IS EXPRESSLY PROHIBITED WITHOUT THE PRIOR WRITTEN CONSENT OF THE BILCO COMPANY. THE INFORMATION CONTAINED HEREIN REMAINS THE PROPERTY OF THE BILCO COMPANY. ALL RIGHTS RESERVED.

SPECIFICATIONS

1. Bilco heavy duty forged stainless steel hinges with stainless steel pins
2. Bilco automatic hold open arm
3. 1-1/2" drain coupling
4. Standard slam lock
5. 1/4" aluminum diamond pattern plate cover
6. Bilco 1/4" aluminum channel frame with recessed anchors
7. Stainless steel spring lifting mechanism

SHOP FINISH:
ALUMINUM: MILL FINISH
HARDWARE: TYPE 316 STAINLESS STEEL
(unless otherwise specified)

REINFORCED FOR H20 LOADING

INSTALLER NOTES:

A. Use caution. Cover is spring loaded. Do not remove safety shipping bolt until unit is to be installed and in normal horizontal operating position.
B. Be sure unit is set on slight pitch toward drain corner.
C. Before anchoring in place open and close door. Check to see that the door in the closed position rests on the frame all around. If not, shim under the frame at the proper corner.
D. Do not reduce 1 1/2" drain pipe to dry well or disposal system.
E. Bend down anchors if required

Customer:

P.O. N°

Job:

Sales Rep:

Manufacturers of Doors for Special Services
THE BILCO COMPANY
New Haven, Connecticut 06505

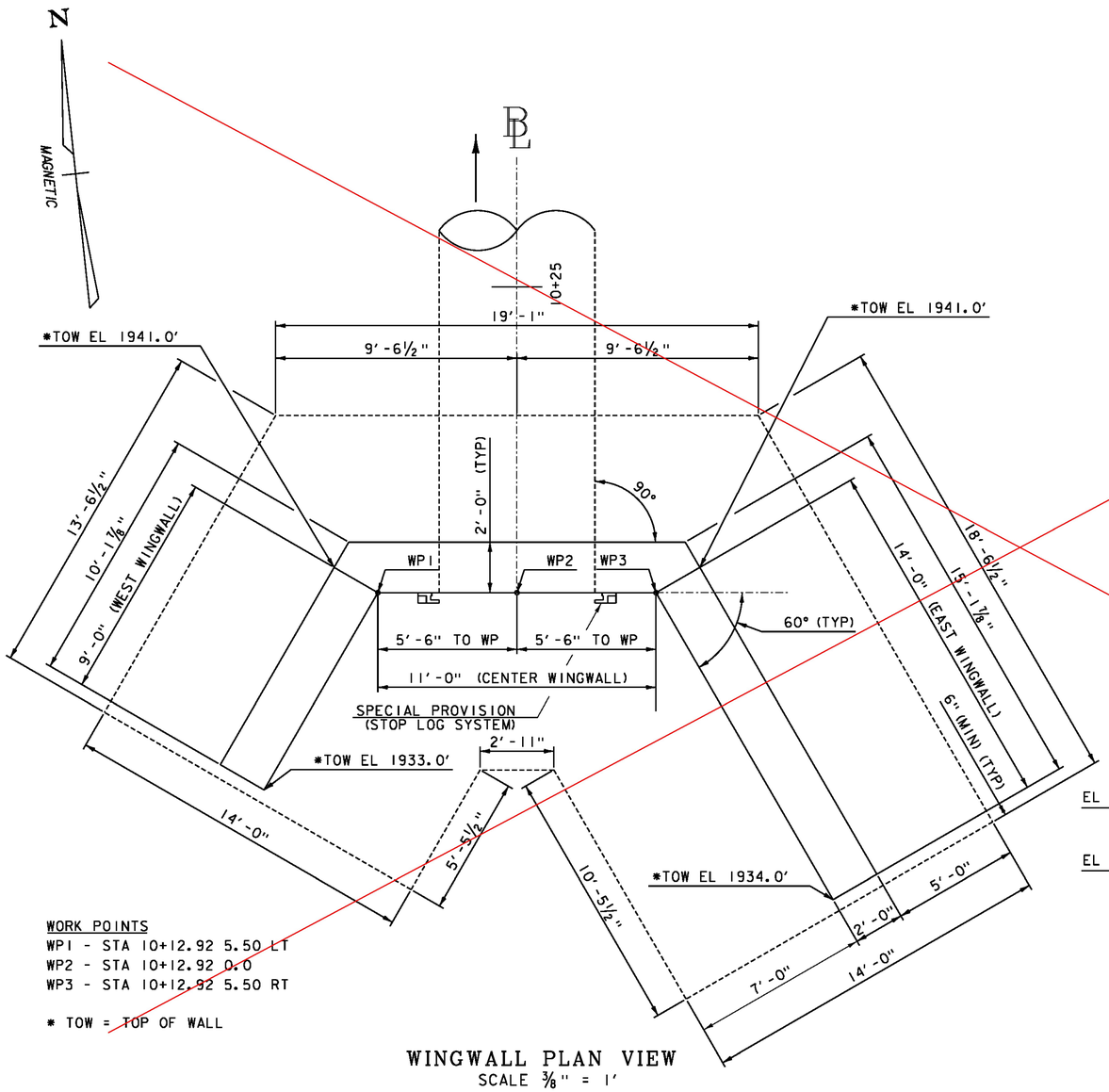
SINGLE LEAF ACCESS DOOR
TYPE J-ALH20 - EXTERIOR

QTY	TYPE	SIZE WIDTH x LENGTH
	J-1ALH20	2'-0" x 2'-0" [610mm] x [610mm]
	J-2ALH20	2'-6" x 2'-6" [762mm] x [762mm]
1	J-3ALH20	3'-0" x 2'-6" [914mm] x [762mm]
	J-4ALH20	3'-0" x 3'-0" [914mm] x [914mm]
	J-5ALH20	3'-6" x 3'-6" [1065mm] x [1065mm]

© 11-16-09 THE BILCO COMPANY

RECORD PLANS

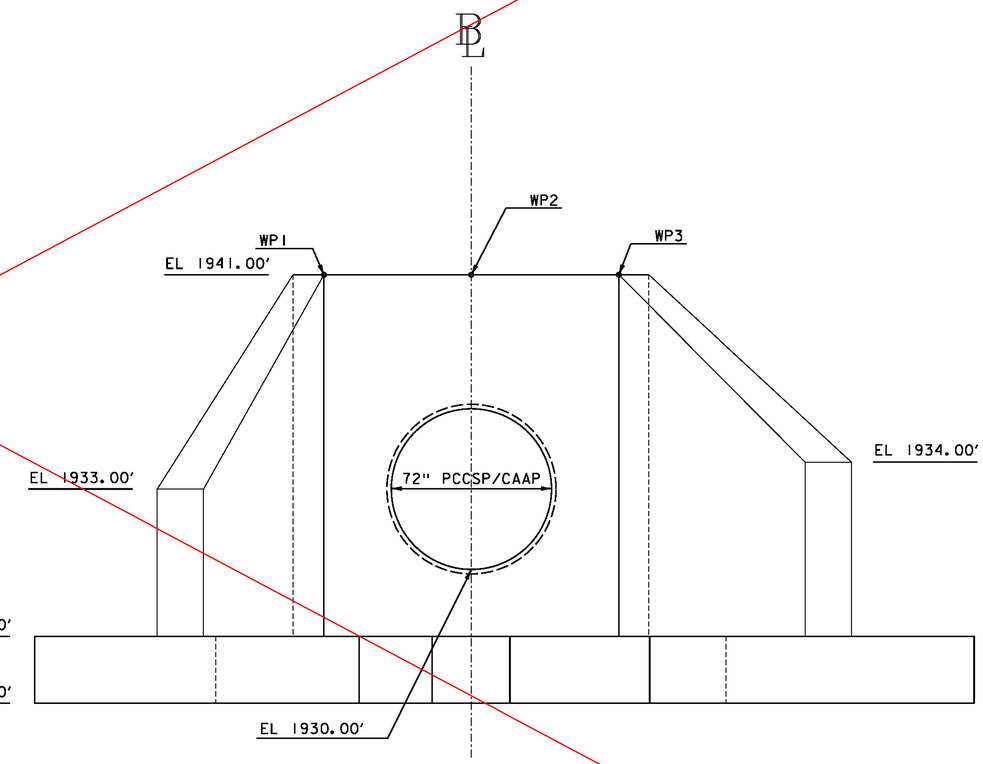
ADDED SHEET STR #1 DETAILS



WORK POINTS
WP1 - STA 10+12.92 5.50 LT
WP2 - STA 10+12.92 0.0
WP3 - STA 10+12.92 5.50 RT

* TOW = TOP OF WALL

WINGWALL PLAN VIEW
SCALE ⅜" = 1'

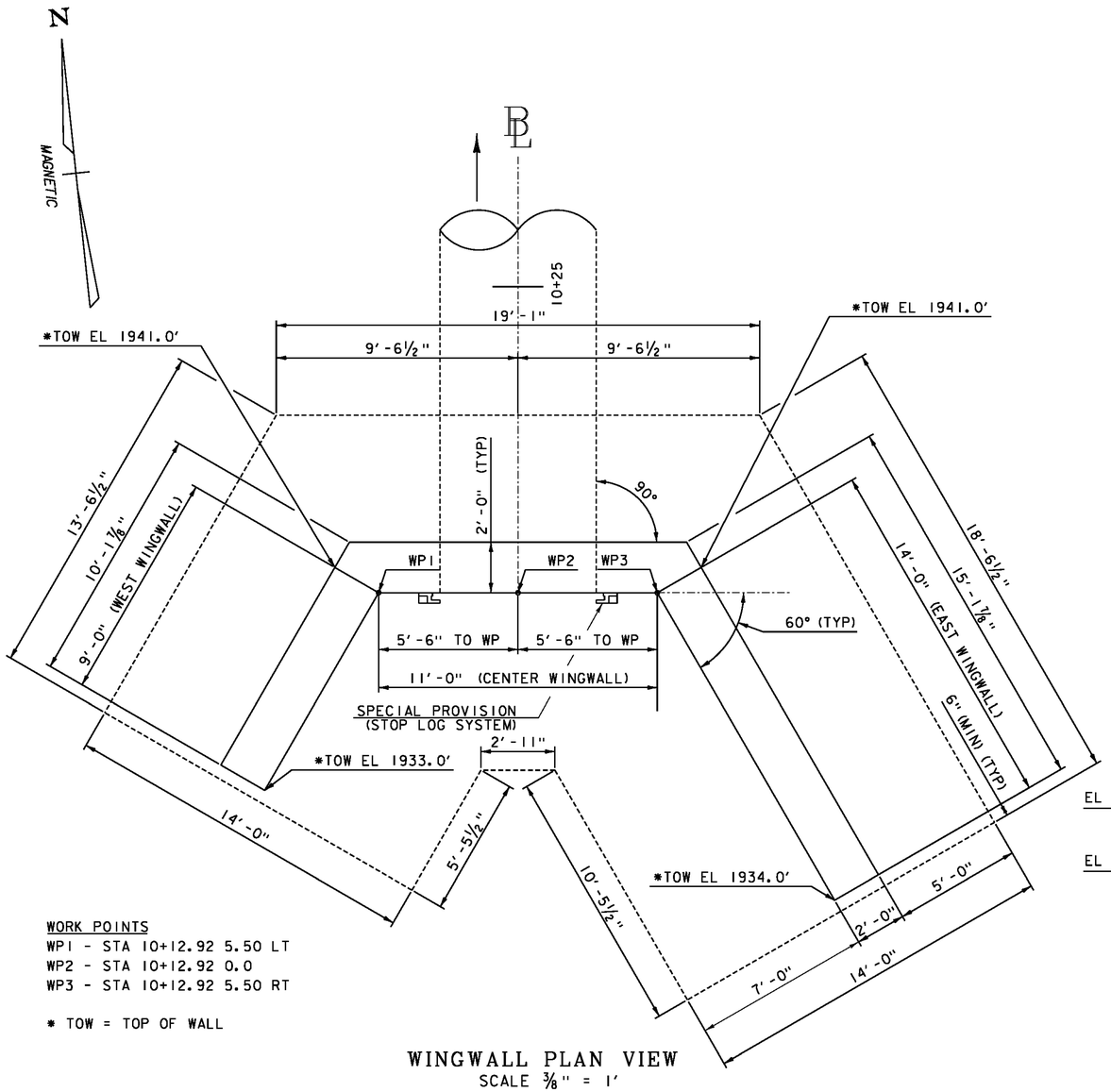


WINGWALL ELEVATION VIEW
SCALE ⅜" = 1'

THIS SHEET REPLACED BY FOLLOWING SHEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

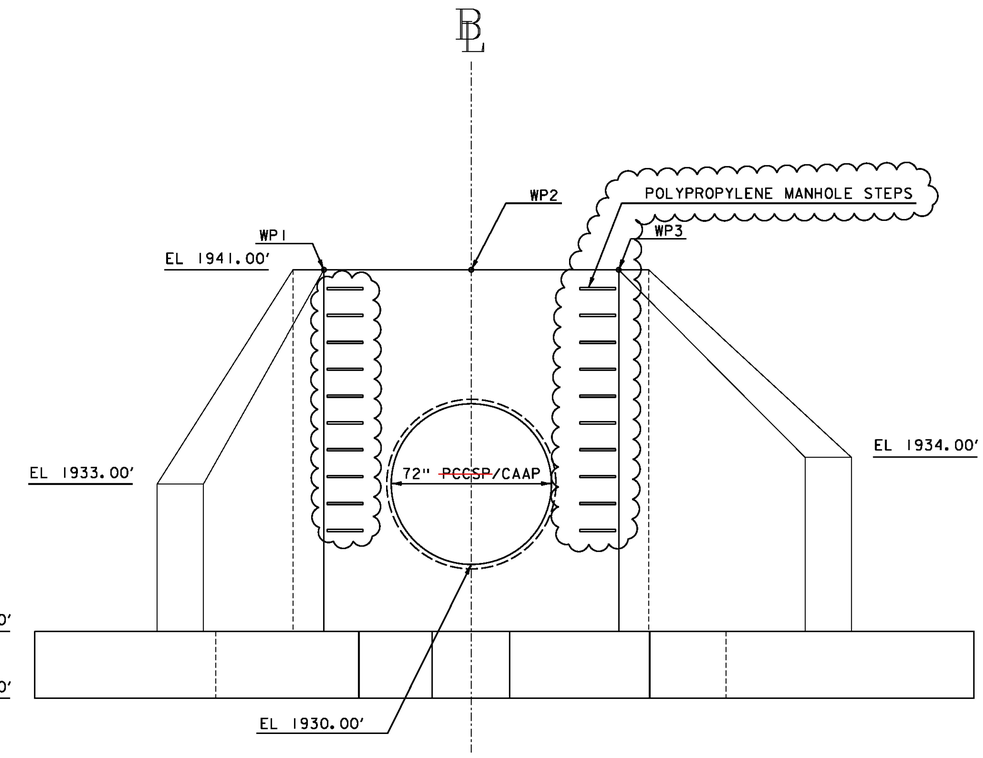
PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 3	SHEET 9 OF 45



WORK POINTS
WP1 - STA 10+12.92 5.50 LT
WP2 - STA 10+12.92 0.0
WP3 - STA 10+12.92 5.50 RT

* TOW = TOP OF WALL

WINGWALL PLAN VIEW
SCALE ⅜" = 1'

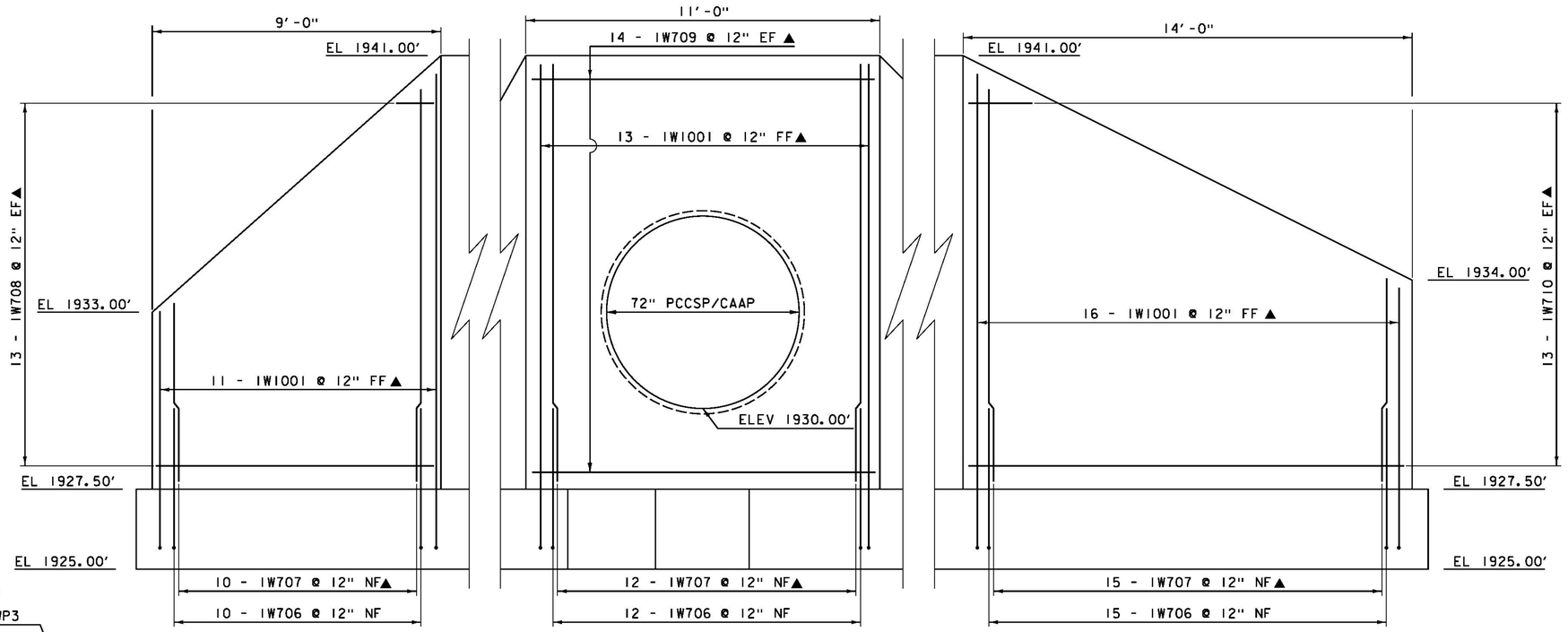


WINGWALL ELEVATION VIEW
SCALE ⅜" = 1'

THIS SHEET REPLACES PRECEDING SHEET

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 3	SHEET 9R OF 45

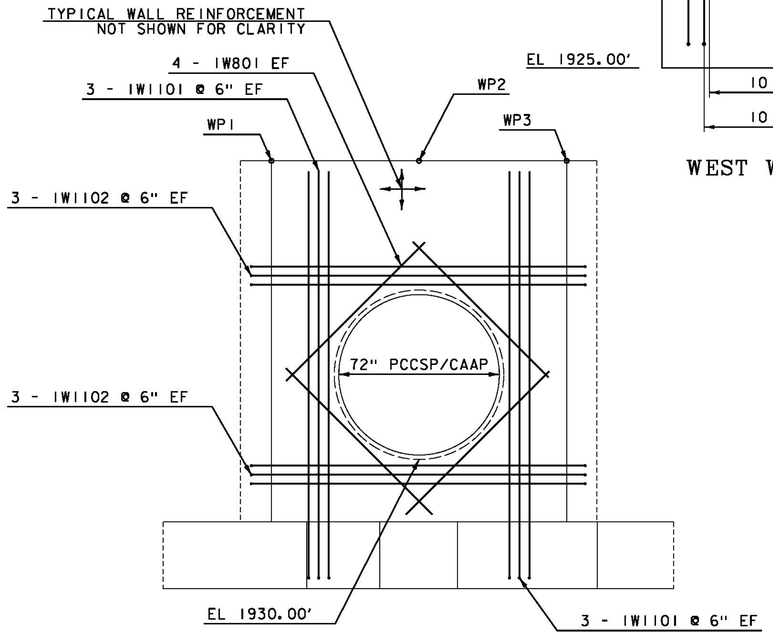
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS



WEST WINGWALL ELEVATION
SCALE 1/2" = 1'

HEADWALL ELEVATION
SCALE 1/2" = 1'

EAST WINGWALL ELEVATION
SCALE 1/2" = 1'

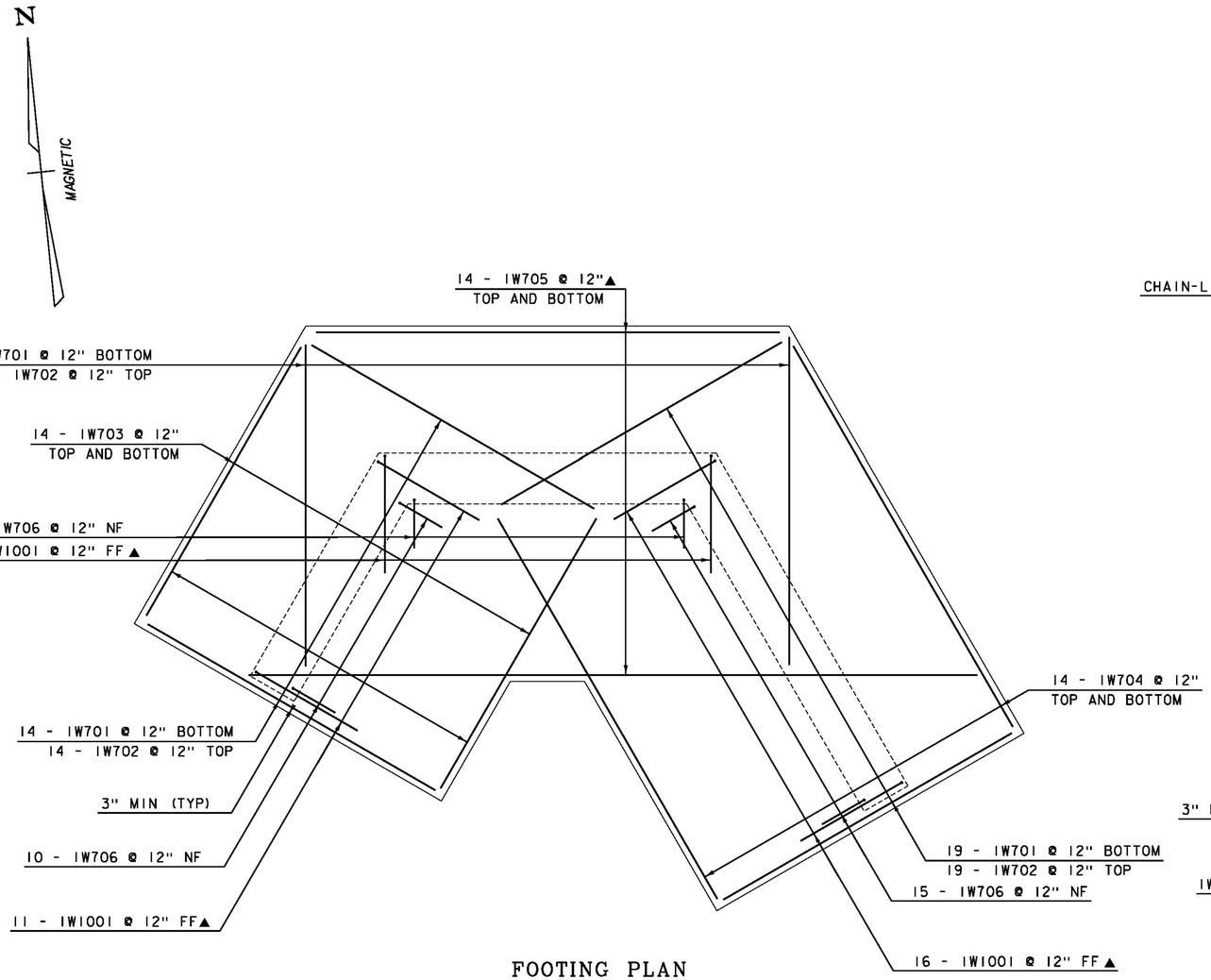


HEADWALL ADDITIONAL PIPE REINFORCING DETAIL
SCALE 3/8" = 1'

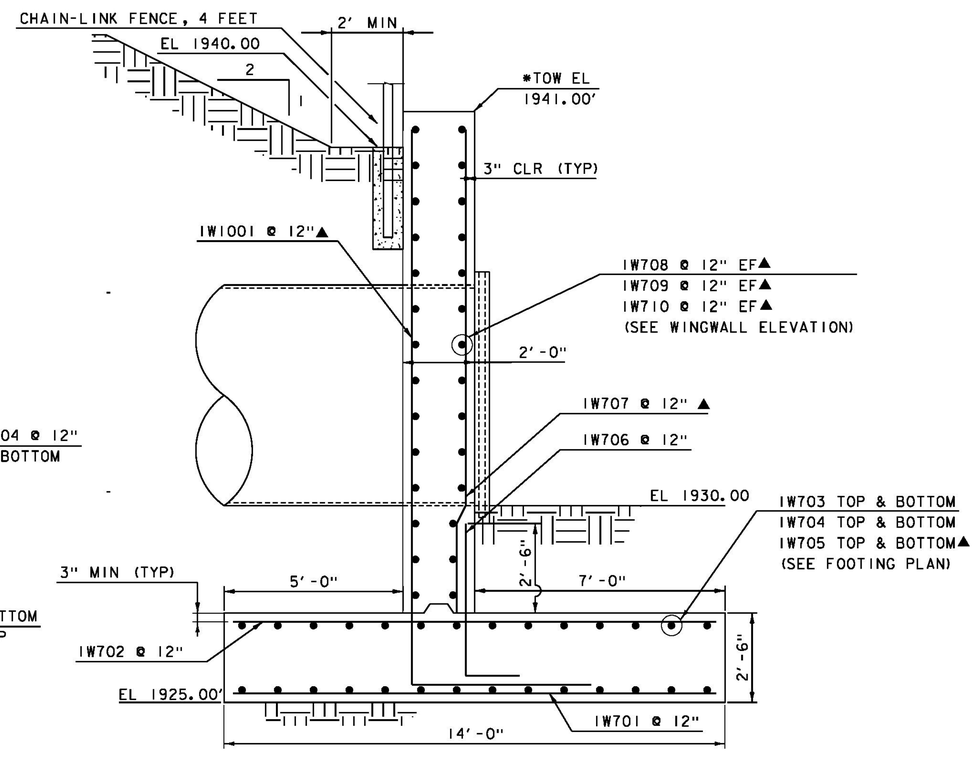
WALL AND FOOTING REINFORCING DETAILS

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07bl06det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 4	SHEET 10 OF 45



FOOTING PLAN
(BOTTOM REINFORCEMENT SHOWN, TOP SIMILAR)
SCALE 3/8" = 1'



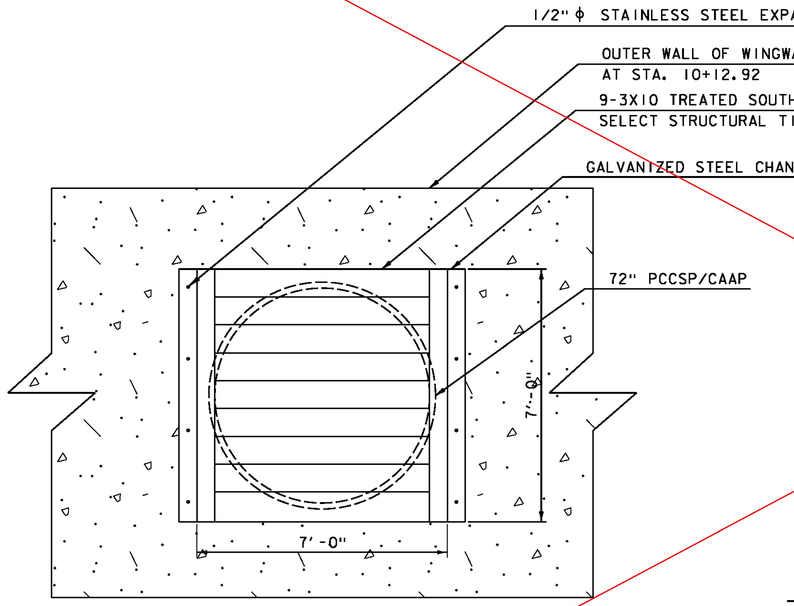
HEADWALL/WINGWALL SECTION
SCALE 1/2"=1'

*TOW = TOP OF WALL

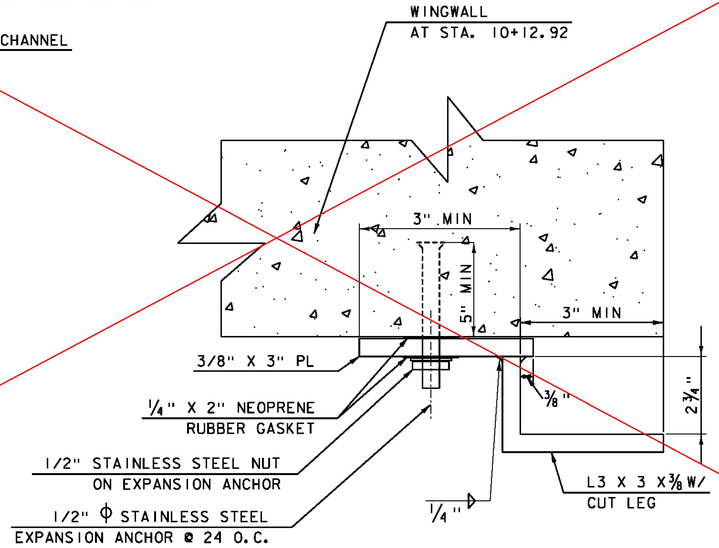
WALL AND FOOTING REINFORCING DETAILS

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

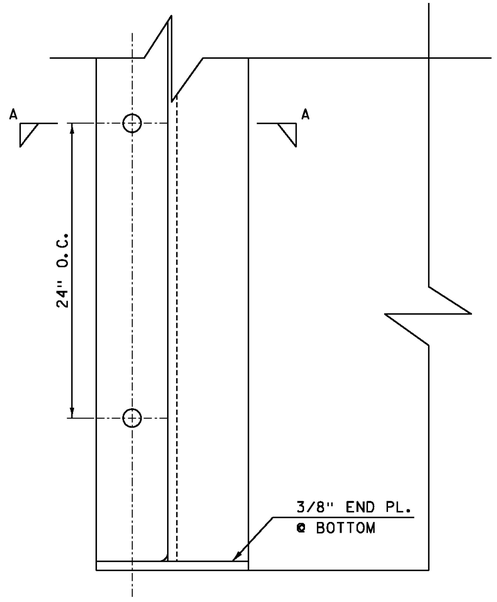
PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 5	SHEET 11 OF 45



FRONT VIEW - SPECIAL PROVISION (STOP LOG SYSTEM)
NOT TO SCALE



GALVANIZED STEEL CHANNEL
SECTION A-A
NOT TO SCALE



GALVANIZED STEEL CHANNEL
NOT TO SCALE

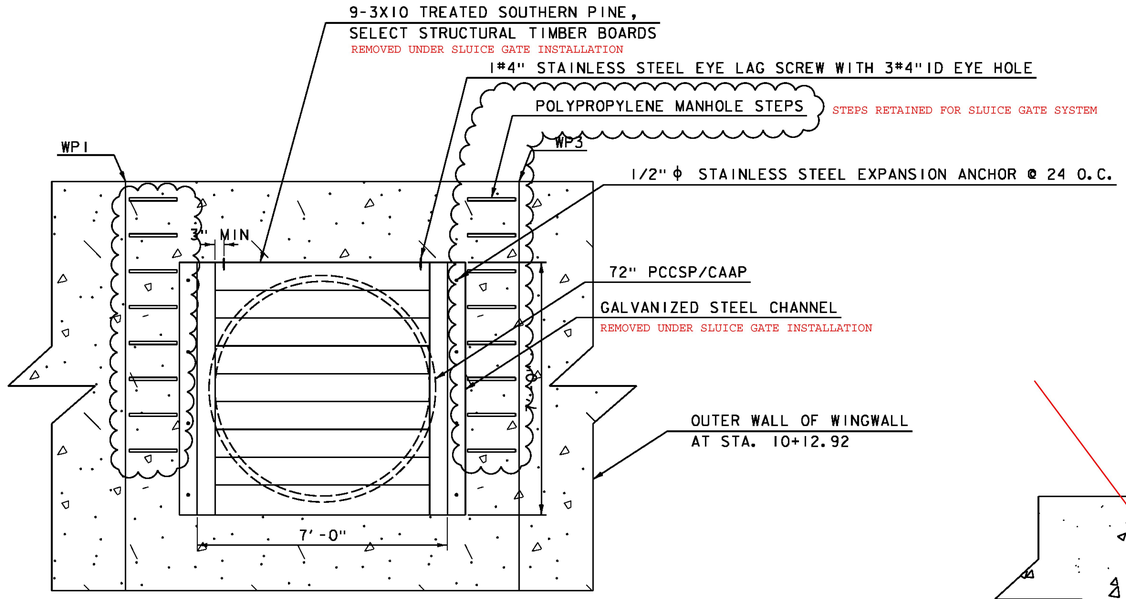
SPECIAL PROVISION (STOP LOG SYSTEM)

THIS SHEET REPLACED
BY FOLLOWING SHEET

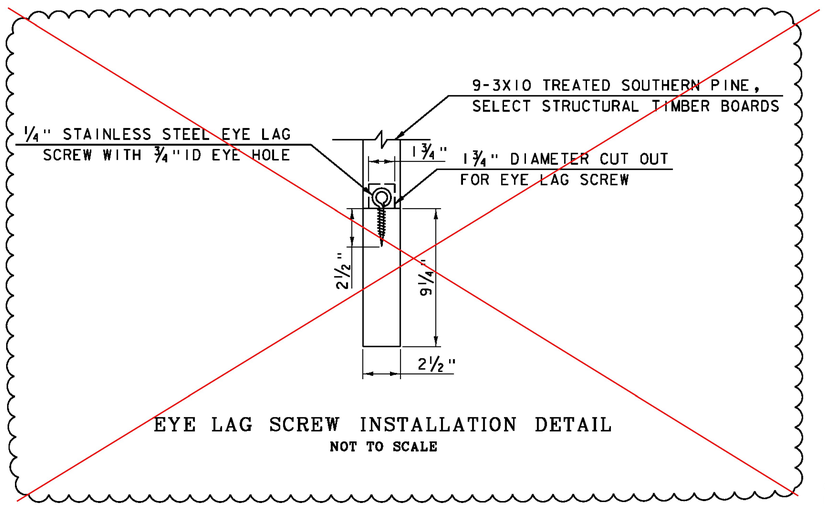
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07bl06det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 6	SHEET 12 OF 45

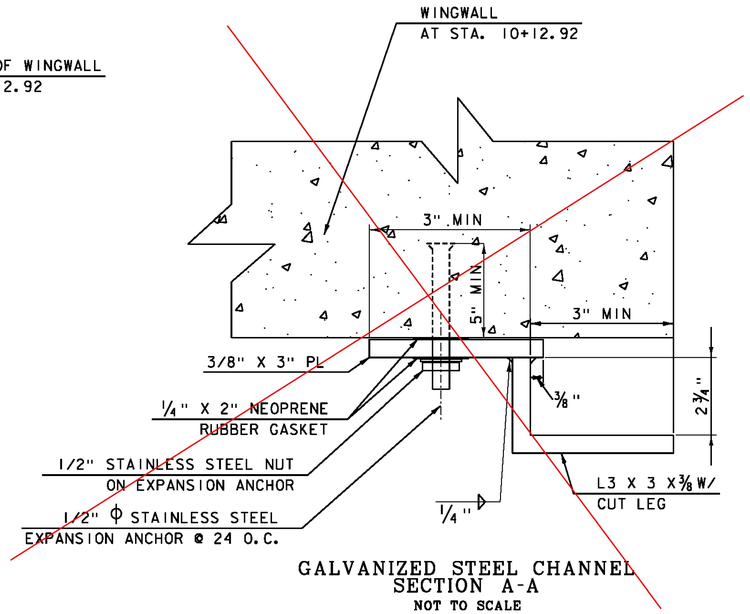
NOTE:
STOP LOG SYSTEM INITIALLY INSTALLED; DUE TO FAILURE, SYSTEM WAS REPLACED IN JUNE 2018 WITH A SLUICE GATE. SEE FOLLOWING SHEETS FOR SLUICE GATE SYSTEM.



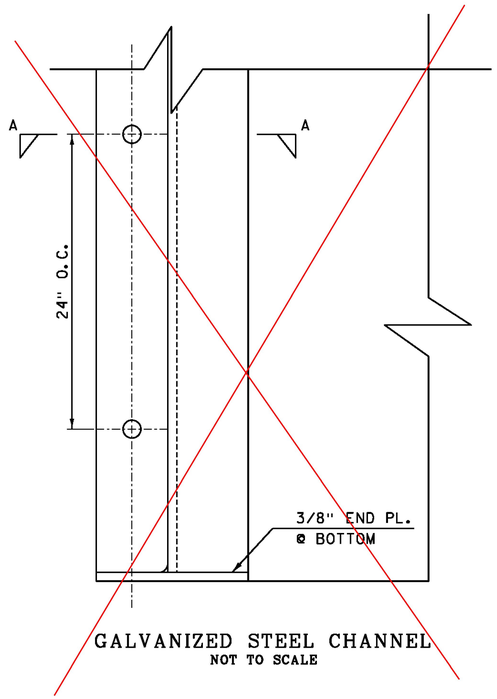
FRONT VIEW - SPECIAL PROVISION (STOP LOG SYSTEM)
NOT TO SCALE



EYE LAG SCREW INSTALLATION DETAIL
NOT TO SCALE



GALVANIZED STEEL CHANNEL
SECTION A-A
NOT TO SCALE



GALVANIZED STEEL CHANNEL
NOT TO SCALE

SPECIAL PROVISION (STOP LOG SYSTEM)

THIS SHEET REPLACES PRECEDING SHEET

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106det.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: B. KHALIFA	CHECKED BY: B. KHALIFA
DETAIL SHEET 6	SHEET 12R OF 45

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

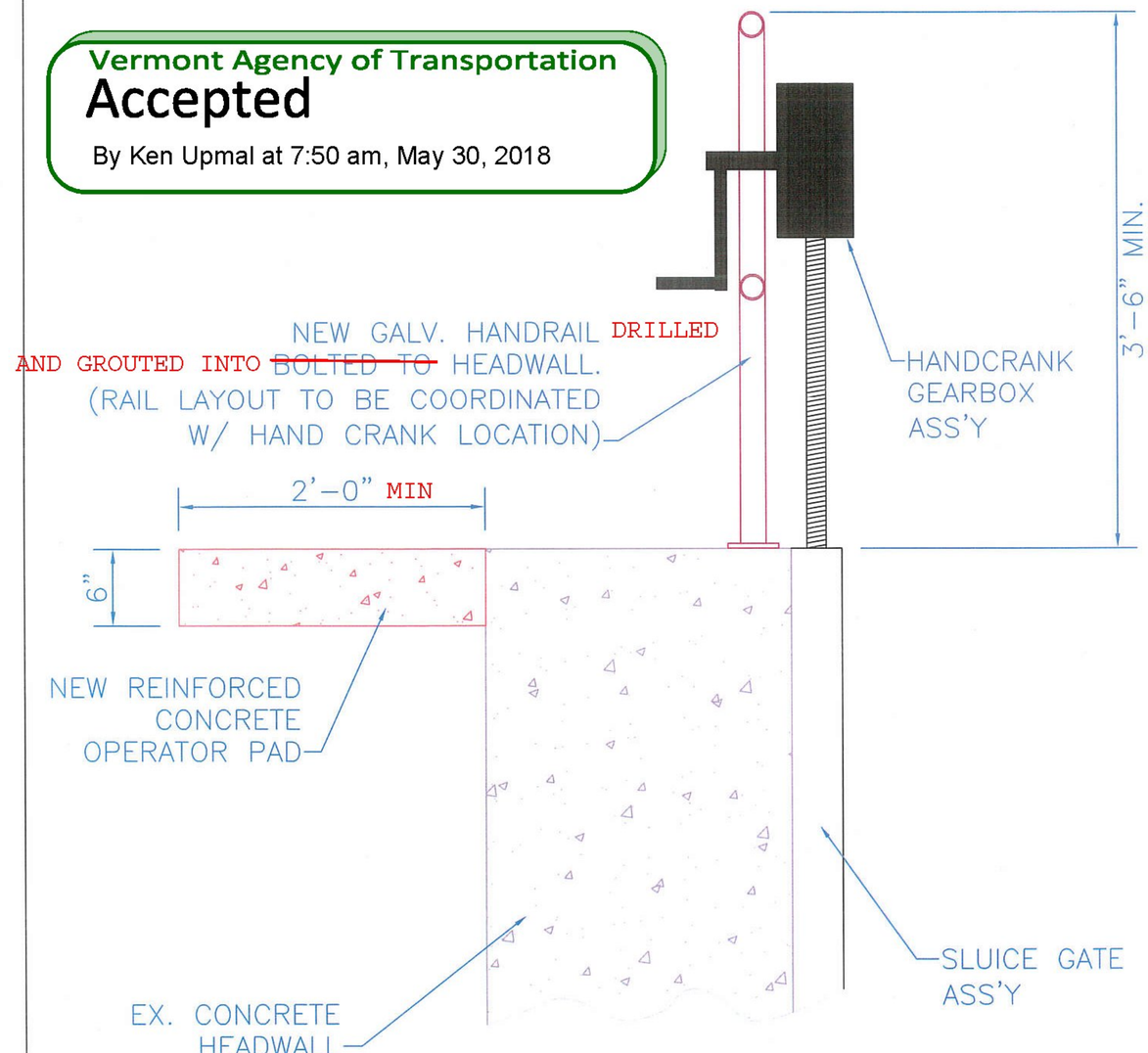
R. I. B. RENAUD BROS. INC.
STEEL SALES & FABRICATION
VERNON VT. USA

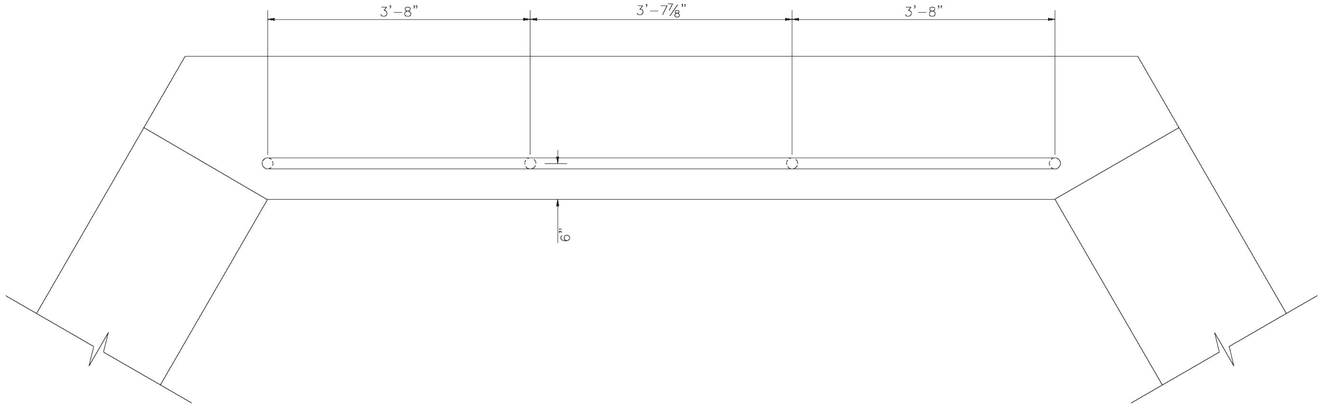
283 FT. BRIDGMAN RD. VERNON VT., 05354
PH. (802) 257-7383 FAX:(802) 257-7308

JOB NAME: PERU
JOB # STP SCRP(4)
DRAWN BY: A.D.
DATE: 6/14/17 DATE DUE:
SHEET 1 OF 1

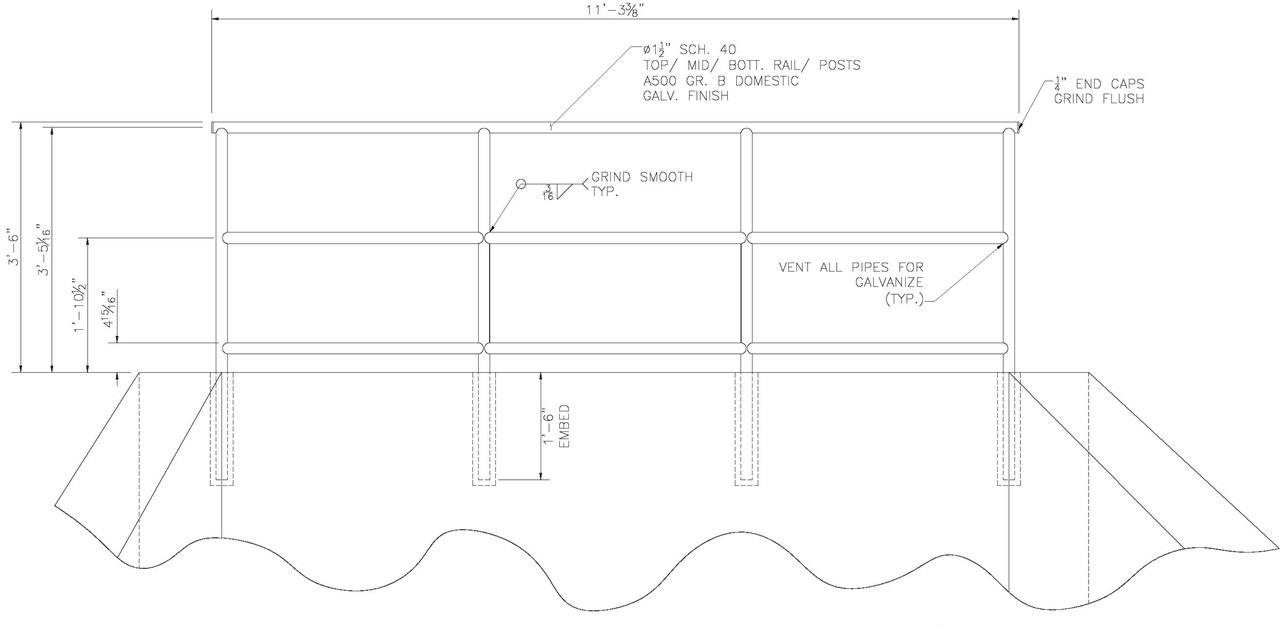
HEADWALL SECTION

Vermont Agency of Transportation
Accepted
By Ken Upmal at 7:50 am, May 30, 2018





RAILING PLAN



The calculation is not properly done and is difficult to understand. However, we performed our own independent analysis on the railings and posts and found that the 1 1/2" pipes are within the allowable stress limit and are acceptable.

B. RENAUD BROS. INC.
STEEL SALES & FABRICATION
VERNON VT. USA
283 FT. BRIDGMAN RD. VERNON VT., 05354
PH. (802)257-7383 FAX (802)257-7308

WELDING PROCEDURE

NO. RB-FW-001

DATE:	2/26/2017	PROJECT NAME:	PERU
BY:	A. DUNKLEE	PROJECT NO.	STP SCRP(4)
AWS CODE:	D1.5	PQR REF. NO:	N/A

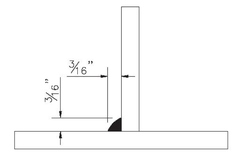
MATERIAL SPECIFICATION:	ASTM 500 GR. B		
WELDING PROCESS:	SMAW		
MANUAL, SEMI-AUTOMATIC OR AUTOMATIC:	MANUAL		
WELDING POSITION:	ALL		
FILLER METAL SPECIFICATION:	ANSI/AWS A5.1-A5.5		
FILLER METAL CLASSIFICATION:	E7018		
FLUX:	N/A		
SHIELDING GAS:	N/A	FLOW RATE:	N/A
SINGLE OR MULTIPLE PASS:	SINGLE		
SINGLE OR MULTIPLE ARC:	SINGLE		
WELDING CURRENT:	DC		
WELDING POLARITY:	ELECTRODE POSITIVE		
WELDING PROGRESSION:	N/A		
ROOT TREATMENT:	REMOVE ALL IMPURITIES & GALV.		
PREHEAT & INTERPASS TEMPERATURE:	≥½"=70°F 1½"-2½"=150°F OVER 2½"=225°F		
POSTHEAT TREATMENT:	N/A		
HEAT INPUT:	MIN: N/A	MAX:	N/A
ELECTRODE STICKOUT:	N/A		

APPROVAL STAMP

PASS NO.	ELECTRODE SIZE:	WELDING CURRENT AMPS	WELDING CURRENT VOLTS	TRAVEL SPEED
AS REQ.	3/32"	70-110		ADJUST AS REQ.
	1/8"	70-170		

NOTES:

JOINT DETAIL:



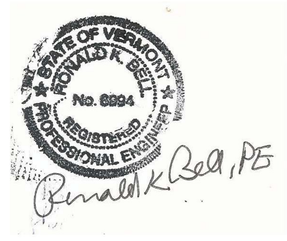
Vermont Agency of Transportation
Accepted
By Ken Upmal at 10:15 am, Apr 06, 2018

SUBMITTAL REVIEW

X	NO EXCEPTIONS TAKEN
	MAKE CORRECTIONS NOTED
	REVISE AND RESUBMIT
	REJECTED

CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES; AND THE SATISFACTORY PERFORMANCE OF THE WORK.

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS
CHECKED BY MS DATE 4/05/2018
SIGNED BY BK DATE 4/05/2018



NOTES:
ALL EXPOSED EDGES GROUND TO A 1/16" RADIUS
ALL MATERIALS TO BE DOMESTIC
ALL WELDING TO BE PERFORMED BY VTrans QUALIFIED WELDER

MATERIALS	A500 GR. B
HOLE SIZE	N/A
BOLT SPECS.	N/A
FINISH	GALV.

SHEET NAME: RAIL LAYOUT

PROJECT NAME: PERU
PROJECT NO: STP SCRP(4)
PROJECT OWNER: VTrans
DRAWN BY: A.D. CHK'D BY: C.E. DATE: 2/26/18
SHEET NO. 1 OF 1

REV. NO.	DATE:

B. RENAUD BROS. INC.
STEEL SALES & FABRICATION
VERNON VT. USA
283 FT. BRIDGMAN RD. VERNON VT., 05354
PH. (802) 257-7383 FAX: (802) 257-7308

EMBEDDED DEPTH FOR ALL THREADED STUDS			
DIAMETER	EMBEDDED DEPTH	HOLE DEPTH	HOLE DIA.
3/4	14	11-1/4	7/8

4

Contractor to field verify all elevations and dimensions with as built conditions.

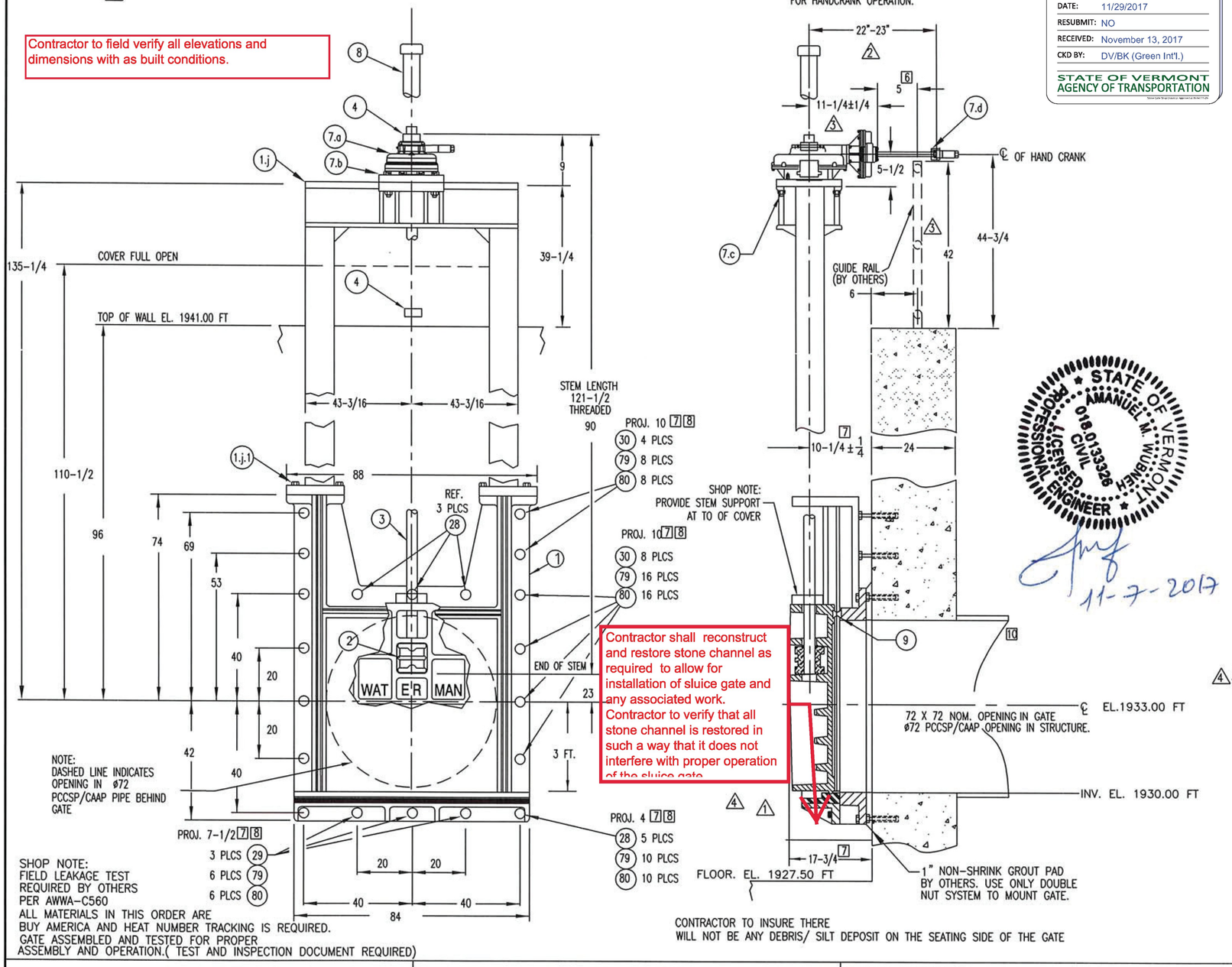
Contractor to confirm in the field that adequate clearance will be provided.

NOTE:
HANDRAIL BY OTHERS (NOT SHOWN) CONTRACTOR TO ENSURE CLEARANCE FOR HANDCRANK OPERATION.

Approved AsNoted

BY:	Ken Upmal
DATE:	11/29/2017
RESUBMIT:	NO
RECEIVED:	November 13, 2017
CKD BY:	DV/BK (Green Int'l.)

STATE OF VERMONT
AGENCY OF TRANSPORTATION



Contractor shall reconstruct and restore stone channel as required to allow for installation of sluice gate and any associated work. Contractor to verify that all stone channel is restored in such a way that it does not interfere with proper operation of the sluice gate.

STATE OF VERMONT
AMANUEL M. WUBNEH
018.013326
CIVIL
LICENSED PROFESSIONAL ENGINEER

11-7-2017

MATERIAL KEY	FINISH KEY	PAINT KEY
1. CAST IRON:ASTM A-126 CL. B 4. MANG. BRZ.:ASTM B-584 AL. C86500 5. NAVAL BRZ.:ASTM B-21 AL. C48200 9B. STN STL SHAPES:ASTM A-276 TY.316/316L D/C 13. NEOPRENE RUBBER:ASTM D-2000 14. CLEAR PLASTIC BUTYRATE PIPE:ASTM D-707 15B. STN STL HDW:ASTM F-593G/H & 594 GRP 2 (TY 316) 20. CAST ALUMINUM: ASTM B-26 35A. PVC PLASTIC PIPE:ASTM D-1785	1. AS CAST 2. MILL 3. MACHINED 4. GALVANIZE-ASTM A-123 5. GALVANIZE-ASTM A-153 6. SEE PAINT KEY 7. ZINC PLATED	6E BLAST CLEAN PER SSPC-SP10 PRIME (1) CT (3 MILS) & PAINT (2) CTS (4 MILS/CT) TDFT-11 MILS POLYAMIDE EPOXY COLOR: GRAY 6H-L VENDOR PRIME COAT [6] (2) CTS POLYAMIDE EPOXY PAINT & (1) CT POLYURETHANE ENAMEL (TDFT-7 MILS) COLOR: GRAY [6] 6H BLAST CLEAN PER SSPC-SP6 (2) CTS POLYAMIDE EPOXY PAINT & (1) CT POLYURETHANE ENAMEL (TDFT-7 MILS) COLOR: GRAY [6]

ITEM DESCRIPTION	MATERIAL KEY	FINISH KEY	PART NO. OR SIZE (FOR WATERMAN USE ONLY)	QTY/ GATE	TOTAL QTY
1. SLUICE GATE ASSEMBLY - 72x72 QS-5000-F	–	–	REF. 100103	1	1
a) FRAME	1	6E	W-5477-01-01	1	
b) COVER	1	6E	W-5480-02-01	1	
c) SEAT	5	2	1-1/8 IN WIDE EXT. (REF. 100077)	A/R	
d) GUIDE RAIL	1	6E	W-5096 L&R	1 EA	
e) SIDE WEDGE ASSEMBLY	–	–	SYSTEM B (REF. 100067)	4 EA	
1) FRAME WEDGE	4	1,3	W-5004 L&R (REF. 100065)	4 EA	
2) COVER WEDGE	4	1,3	W-5139 L&R (REF. 100066)	4 EA	
3) ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
f) TOP WEDGE ASSEMBLY	–	–	REF. 100074	4	
1) TOP WEDGE	4	1,3	W-5006 (REF. 100069)	4	
2) WEDGE BLOCK BRACKET	4	1,3	W-5007 (REF. 100070)	4	
3) ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
h) FLUSHBOTTOM ASSEMBLY	–	–	REF. 102982	1	
1) BRACKET	1	6E	W-5156-00-01	1 EA.	-
2) SEAL	13	2	76 INCHES (REF. 102981)	1	
3) SEAL RETAINER	9B	2	–	1	
4) ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
j) YOKE	1	6E	REF. 105207	1	
1) ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
2. THRUST NUT (W-5014)	4	2,3	2-1/2 DIA, 4 TPI, LH (REF. 101224-91) [5]	1	1
3. STEM (RISING)	9B	2	2-1/2 DIA, 4 TPI, LH (REF. 108130-1) [5]	1	1
4. LIMIT NUT	1	5	2-1/2 DIA, 4 TPI, LH (REF. 108222-11) [5]	2	2
7. LIFT ASSEMBLY	–	–	–	1	1
a) LIFT	1,4	6H-L	TYPE IB7/AS3 12:1 MOD.EXTEND SHAFT INPUT BY 6 INCHES	1	
b) BASEPLATE	6	6H	CUSTOM FA16 BASEPLATE (SEE BUILD PLANS)	1	
c) HEX HEAD BOLT & WASHER	15B	2	3/4 NC X 4-1/2 LG.	8/8	
d) HANDCRANK (15 INCH RADIUS)	20,35A	2,3	REF. 109919	1	
8. STEM COVER (W/ MYLAR STRIP)	14,35A	2	REF. 102787 (4 in) 78 LG.	1	1
9. STEM COVER ADAPTOR	6,11	4	REF. 104041	1	1
28. ALL THREADED STUD [8]	9B	2,3	3/4 NC X 18 LG.	5	5
29. ALL THREADED STUD [8]	9B	2,3	3/4 NC X 21-1/2 LG.	3	3
30. ALL THREADED STUD [8]	9B	2,3	3/4 NC X 24 LG.	12	12
79. HEX NUT	15B	2	3/4 NC	40	40
80. WASHER	316 SS	2	3/4 DIA.	40	40

4

NOTES: UNLESS OTHERWISE SPECIFIED.
1. (GATE CAPACITY) MAXIMUM SEATING HEAD = 51 FT.; MAXIMUM UNSEATING HEAD = 20 FT.
2. OPERATING HEAD FROM GATE CENTER LINE: SEATING HEAD = 15 FT.; UNSEATING HEAD = 15 FT. [6]
3. LIFT CAPACITY = 15340 LBS @ 25 LBS PULL.
4. TURN HANDWHEEL CCW TO OPEN (RAISE) GATE.
5. 29" MODIFIED STUB ACME THREADS.
6. CONTRACTOR TO VERIFY OR SUPPLY.
7. DIMENSION INCLUDES GROUT PAD THICKNESS.
8. CONTRACTOR TO PROVIDE HILTI HIT-RE 500-V3 (WET OR DRY CONDITIONS), HILTI HY-200 (DRY CONDITIONS ONLY); OR EQUAL.
9. IMPACT INTO DOVETAIL GROOVE/ MACHINE FLAT TO .002 T.I.R. WITH A 63 FINISH OR BETTER.

(1) GATE REQ'D @ STP SCRP(4) [6]

REF. PLAN SHEET: 9 OF 45

Waterman® INDUSTRIES

P.O. BOX 458 * 25500 Road 204 * Exeter, California 93221 * Phone (559)562-4000 * FAX (559)562-2277 * www.watermanusa.com

72 X 72 WATERMAN MODEL QS-5000-F-Y SLUICE GATE

FOR: RENAUD BROS.,INC
283 FORT BRIDGMAN RD#2
VERNON,VT 05354

PO: SIGNED QUOTE 8/9/17

REF: AGENCY OF TRANSPORTATION

ENG:

REV.NO.	DATE	BY	JOB NO.	PROJECT MANAGER	
			M028960C	FRANK SOTO	
REV.NO. 4	DATE (ANCHOR. REV.) NOV. 07, '17 AMW	BY FS	QUOTE NO. WQ17-H-28960C	DRAWN BY AMW	CHK'D BY REM	ENGINEER AMW
REV.NO. 3	DATE (CUST. REV.) SEPT.. 05, '17 AMW	BY FS	QUOTE ITEM NO. 1	SHEET 1 OF 1	
REV.NO. 2	DATE (CUST. REV.) AUG. 31, '17 AMW	BY FS	SCALE NTS	DATE AUG. 18, '17	
REV.NO. 1	DATE (CUST. REV.) AUG. 29, '17 AMW	BY FS	DRAWING NO. RB-17-0487		

V:\Draw\RB-17-0487.dwg Nov 07, 2017 - 6:13pm

REUSE OF DOCUMENTS: THIS DOCUMENT AND THE IDEAS AND DESIGNS INCORPORATED HEREIN, AS AN INSTRUMENT OF PROFESSIONAL SERVICE, IS THE INTELLECTUAL PROPERTY OF WATERMAN INDUSTRIES AND IS TO BE CONSIDERED CONFIDENTIAL AND PROPRIETARY. IT, OR THE IDEAS AND CONCEPTS DESCRIBED THEREIN, ARE NOT TO BE USED, IN WHOLE OR IN PART, FOR ANY OTHER USE WITHOUT THE WRITTEN AUTHORIZATION OF WATERMAN INDUSTRIES®

STATE OF VERMONT
AGENCY OF TRANSPORTATION

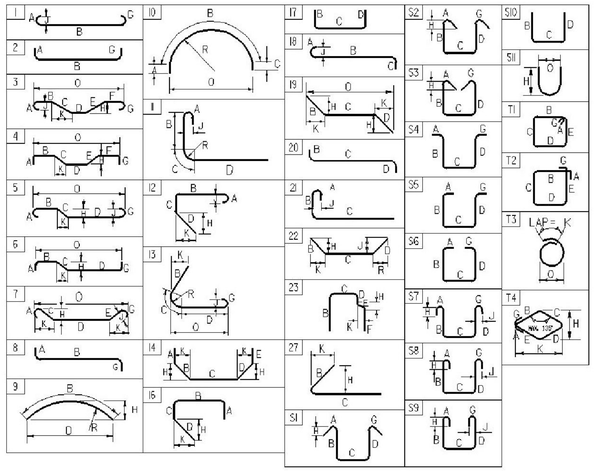
REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
	OUTLET HEADWALL, WINGWALLS AND FOOTING																
	52	7	13'- 6"	1W701	STR												
	52	7	13'- 6"	1W702	STR												
✳	29	7	13'- 0"	1W703	STR												
	28	7	18'- 0"	1W704	STR												
▲	28	7	28'- 6"	1W705	STR												
	37	7	6'- 6"	1W706	17		4'- 6"	2'- 0"									
▲	37	7	13'- 0"	1W707	STR												
▲	26	7	13'- 0"	1W708	STR												
▲	28	7	10'- 6"	1W709	STR												
▲	26	7	13'- 0"	1W710	STR												
✳	9	8	7'- 3"	1W801	STR												
✳ ▲	41	10	18'- 0"	1W1001	17		15'- 6"	2'- 6"									
	12	11	15'- 6"	1W1101	STR												
✳	13	11	13'- 0"	1W1102	STR												

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O

~ NOTES ~

1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31 (ASTM A 615-SI). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE, STANDARD HOOKS ARE TO BE USED.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
8. ▲ DENOTES BARS TO BE CUT IN FIELD.
9. ✳ DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
10. △ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
11. E IN BAR MARK PREFIX DENOTES EPOXY COATED REINFORCING STEEL.



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION DIAMETER INCHES	AREA INCHES^2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106rss.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: B. KHALIFA
REINFORCING STEEL SCHEDULE

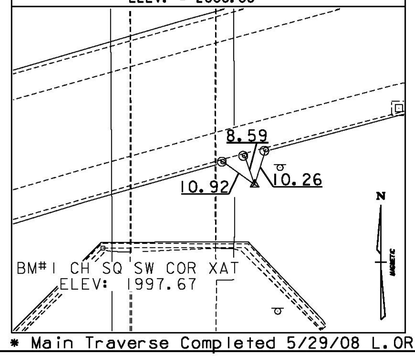
PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: M. CRUZ
SHEET 13 OF 45

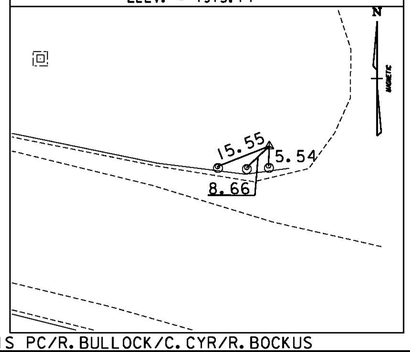
GPS CONTROL POINTS

This Project has Assumed Horizontal and Vertical Datums

TRAVERSE TIES

HVCTRL #1	HVCTRL #2			
NORTH = 1000.00	NORTH = 10067.92	NORTH =	NORTH =	NORTH =
EAST = 50000.00	EAST = 50646.24	EAST =	EAST =	EAST =
ELEV. = 2000.00	ELEV. = 1975.74	ELEV. =	ELEV. =	ELEV. =

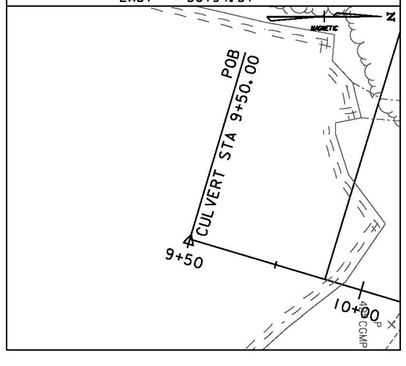


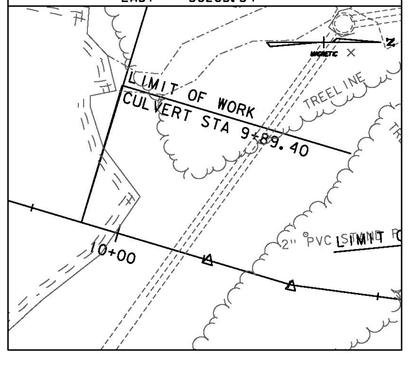


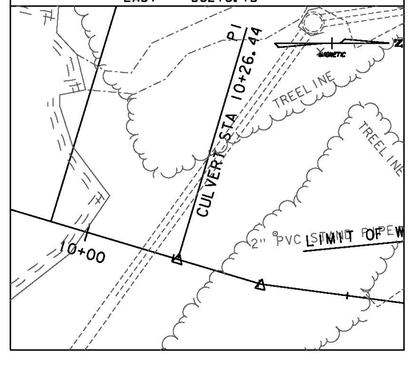
* Main Traverse Completed 5/29/08 L.ORVIS PC/R.BULLOCK/C.CYR/R.BOCKUS

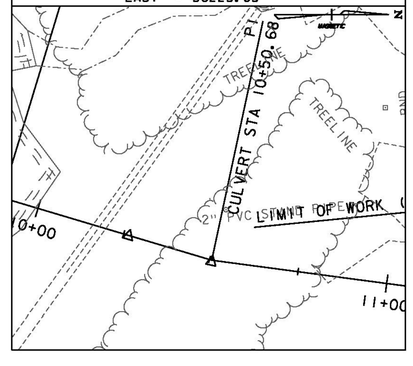
ALIGNMENT TIES

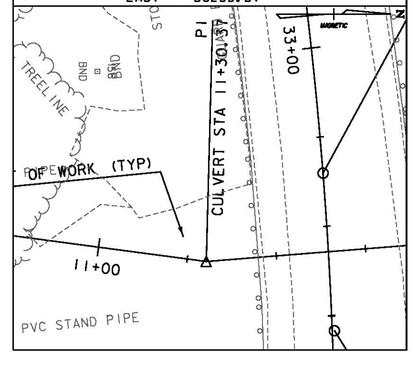
CULVERT POB STA 9+50.00	CULVERT 9+89.40	CULVERT PI STA 10+26.44	CULVERT PI STA 10+50.68	CULVERT PI STA 11+30.37
NORTH = 9859.90	NORTH = 9897.66	NORTH = 9933.16	NORTH = 9956.38	NORTH = 10035.38
EAST = 50194.31	EAST = 50205.54	EAST = 50216.13	EAST = 50223.05	EAST = 50233.57











DATUM	
VERTICAL	ASSUMED
HORIZONTAL	ASSUMED
ADJUSTMENT	NONE

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

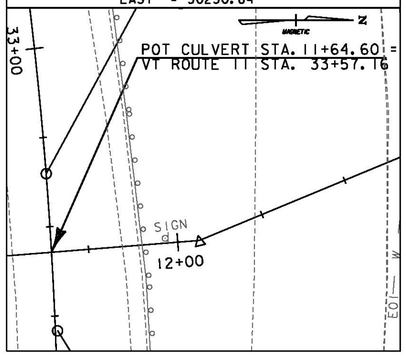
FILE NAME: z07b106t1.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
TIE SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: C. MORIN
CHECKED BY: E. ATKINS
SHEET 14 OF 45

ALIGNMENT TIES

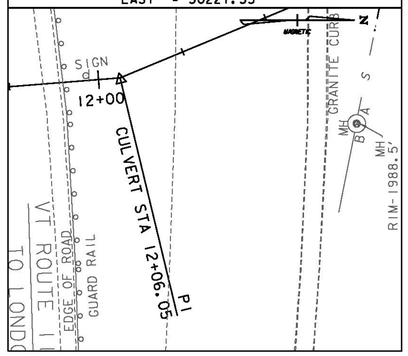
CULVERT POT STA 11+64.60

NORTH = 10069.50
EAST = 50230.84



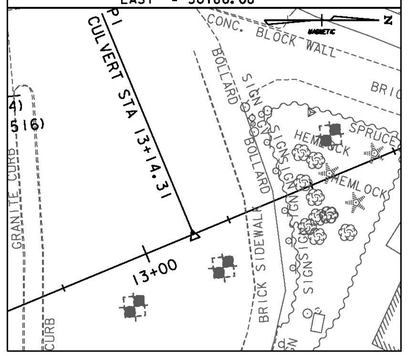
CULVERT PI STA 12+06.05

NORTH = 10110.82
EAST = 50227.53



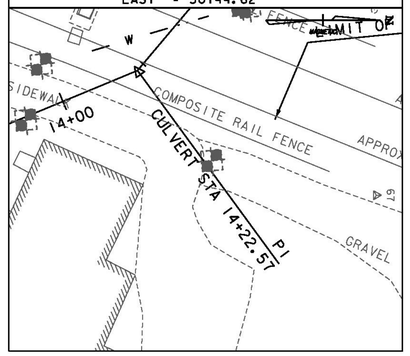
CULVERT PI STA 13+14.31

NORTH = 10210.83
EAST = 50186.08



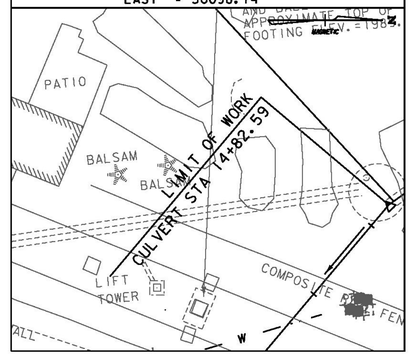
CULVERT PI STA 14+22.57

NORTH = 10310.84
EAST = 50144.62



CULVERT STA 14+82.59

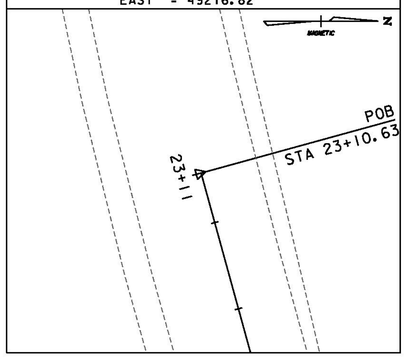
NORTH = 10349.53
EAST = 50098.74



ALIGNMENT TIES

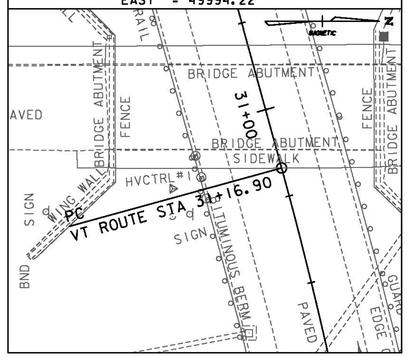
VT ROUTE 11 POB STA 23+10.63

NORTH = 9816.59
EAST = 49216.82



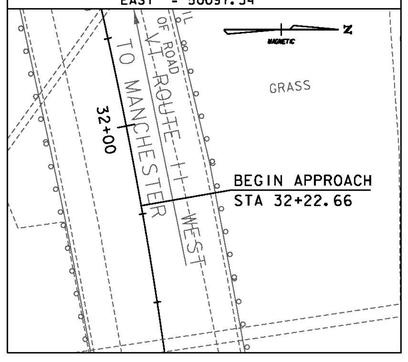
VT ROUTE 11 STA 31+16.90

NORTH = 10030.44
EAST = 49994.22



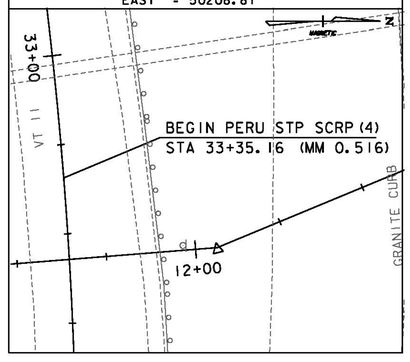
VT ROUTE 11 STA 32+22.66

NORTH = 10053.75
EAST = 50097.34



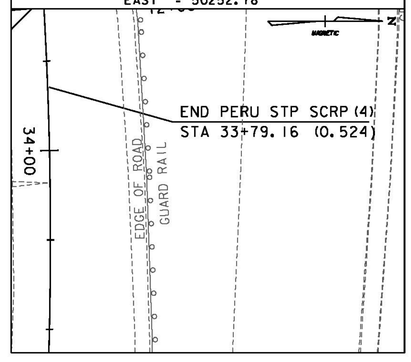
VT ROUTE 11 STA 33+35.16

NORTH = 10068.03
EAST = 50208.87



VT ROUTE 11 STA 33+79.16

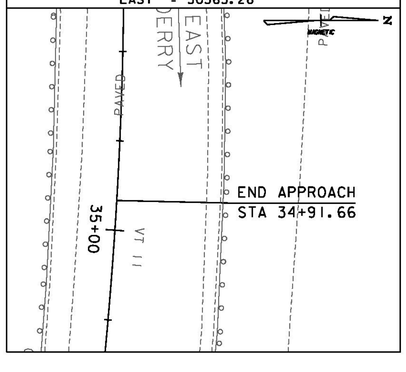
NORTH = 10071.19
EAST = 50252.78



ALIGNMENT TIES

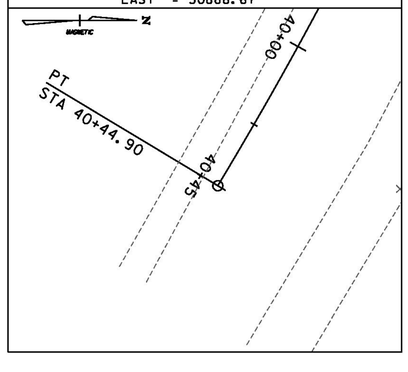
VT ROUTE 11 STA 34+91.66

NORTH = 10069.51
EAST = 50365.26



VT ROUTE 11 STA 40+44.90

NORTH = 9907.61
EAST = 50888.67



DATUM	
VERTICAL	ASSUMED
HORIZONTAL	ASSUMED
ADJUSTMENT	NONE

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

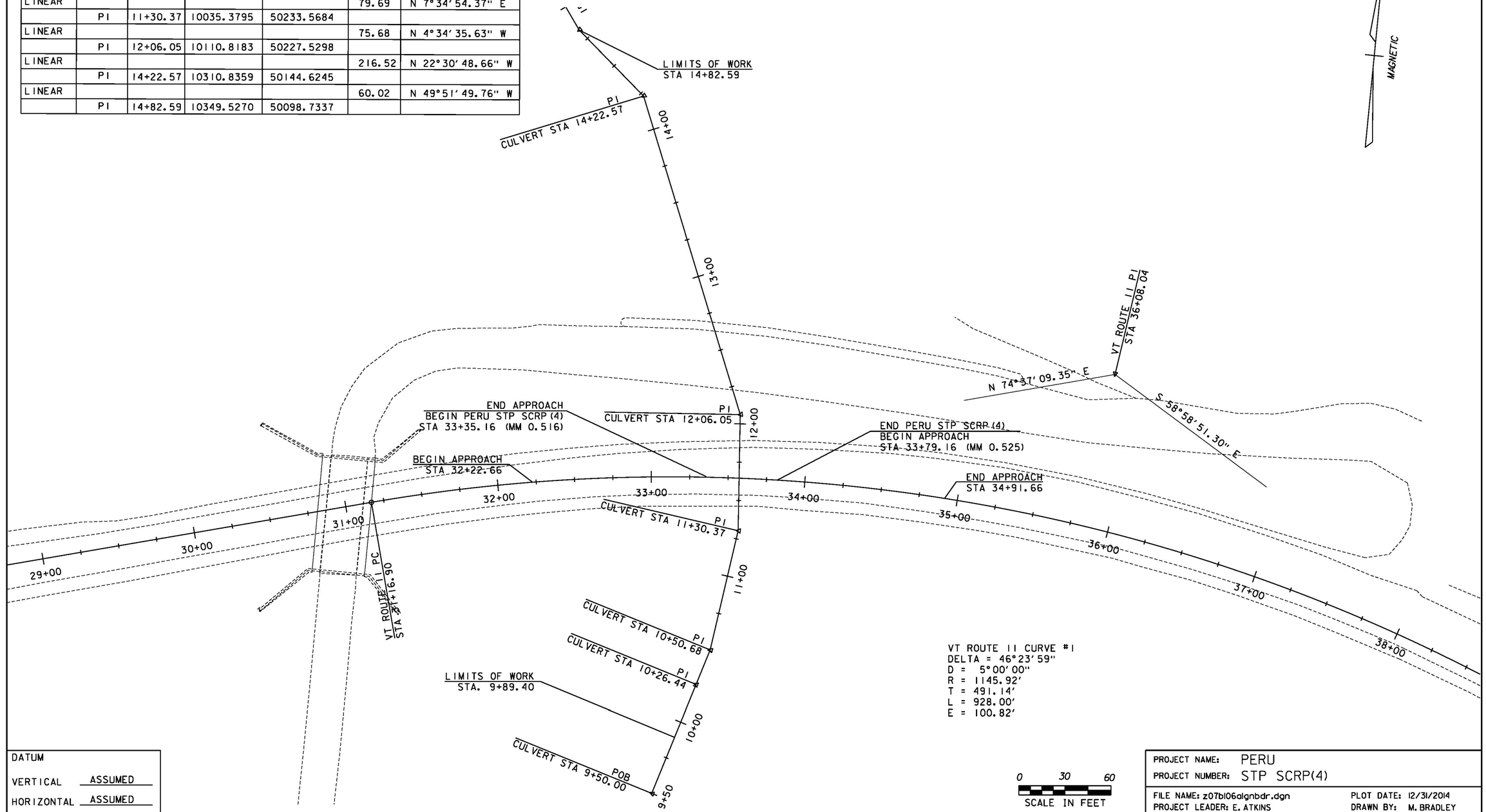
FILE NAME: z07b106t1.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
TIE SHEET 2

PLOT DATE: 12/31/2014
DRAWN BY: C. MORIN
CHECKED BY: E. ATKINS
SHEET 15 OF 45

ALIGNMENT TABLE

CULVERT						
ELEMENT	POINT	STATION	NORTHING	EASTING	LENGTH	BEARING/RADIUS
	POB	9+50.00	9859.8965	50194.3068		
LINEAR					76.44	N 16°35′26.44" E
	PI	10+26.44	9933.1573	50216.1347		
LINEAR					24.23	N 16°35′21.38" E
	PI	10+50.68	9956.3818	50223.0535		
LINEAR					79.69	N 7°34′54.37" E
	PI	11+30.37	10035.3795	50233.5684		
LINEAR					75.68	N 4°34′35.63" W
	PI	12+06.05	10110.8183	50227.5298		
LINEAR					216.52	N 22°30′48.66" W
	PI	14+22.57	10310.8359	50144.6245		
LINEAR					60.02	N 49°51′49.76" W
	PI	14+82.59	10349.5270	50098.7337		

VT ROUTE 11						
ELEMENT	POINT	STATION	NORTHING	EASTING	LENGTH	BEARING/RADIUS
	POB	23+1-.63	9816.5915	49216.8240		
LINEAR					806.27	N 74°37′09.35" E
	PC	31+16.90	10030.4401	49994.2172		
CURVE					928.00	1145.92′
	PT	40+44.90	9907.6102	50888.6713		



VT ROUTE 11 CURVE #1
DELTA = 46°23′59"
D = 5°00′00"
R = 1145.92′
T = 491.14′
L = 928.00′
E = 100.82′

DATUM
VERTICAL ASSUMED
HORIZONTAL ASSUMED
ADJUSTMENT NONE

0 30 60
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106alignbdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
ALIGNMENT SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 16 OF 45

SOIL CLASSIFICATION

AASHTO	
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN kPa	CONSISTENCY
<12	Very Soft
12-24	Soft
24-48	Med. Stiff
48-96	Stiff
96-192	Very Stiff
>192	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

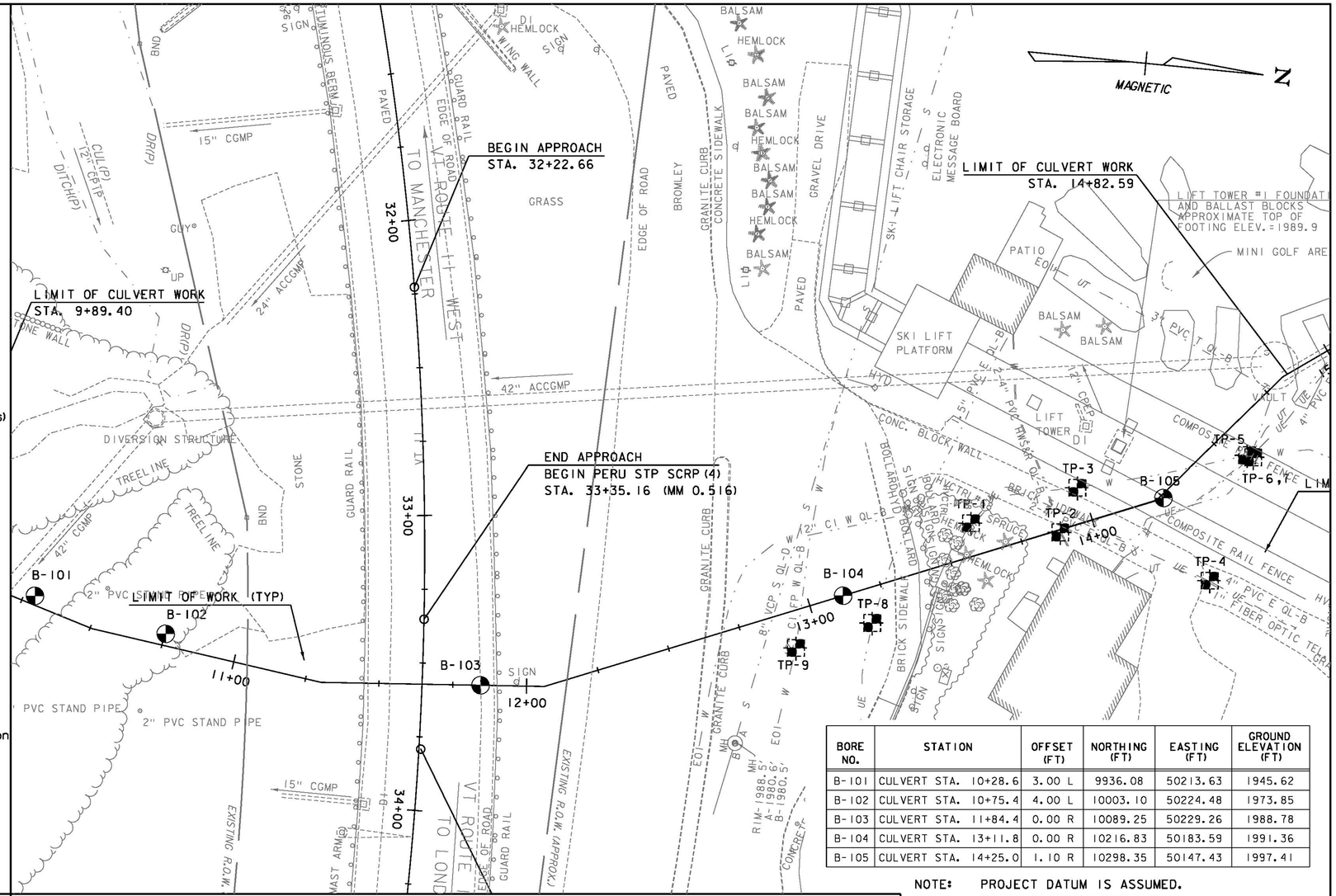
DENSITY (GRANULAR SOILS) N	DESCRIPTIVE TERM	CONSISTENCY (COHESIVE SOILS) N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▼	Water Elevation
⊗	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per 300 mm For: 50.8 mm O.D. Sampler 35.0 mm I.D. Sampler Hammer Weight Of 63.5 kg. Hammer Fall Of 762 mm
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 30.1mm
BX	Core Size 42.0 mm
NX	Core Size 54.7 mm
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
Cl	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	To Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
%Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)
OW	Indicates a temporary observation well installed

COLOR

blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		



BORE NO.	STATION	OFFSET (FT)	NORTHING (FT)	EASTING (FT)	GROUND ELEVATION (FT)
B-101	CULVERT STA. 10+28.6	3.00 L	9936.08	50213.63	1945.62
B-102	CULVERT STA. 10+75.4	4.00 L	10003.10	50224.48	1973.85
B-103	CULVERT STA. 11+84.4	0.00 R	10089.25	50229.26	1988.78
B-104	CULVERT STA. 13+11.8	0.00 R	10216.83	50183.59	1991.36
B-105	CULVERT STA. 14+25.0	1.10 R	10298.35	50147.43	1997.41

NOTE: PROJECT DATUM IS ASSUMED. REFER TO TIE SHEETS FOR HORIZONTAL AND VERTICAL CONTROL

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.

BOULDER - A rock fragment with an average dimension > 304.8 mm.

COBBLE - Rock fragments with an average dimension between 76.2 and 304.8 mm.

GRAVEL - Rounded particles of rock < 76.2 mm and > 2 mm (#10 sieve).

SAND - Particles of rock < 2 mm (#10 sieve) and > 75 μm (#200 sieve).

SILT - Soil < 75 μm (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.

CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.

HARDPAN - Extremely dense soil, cemented layer, not softened when wet.

MUCK - Soft organic soil (containing > 10% organic material.

MOISTURE CONTENT - Weight of water divided by dry weight of soil.

FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.

STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.

DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The test borings shown herein were drilled by the Agency between 6/3/2014 and 6/5/2014.
2. Utility test pits shown herein were performed by Baystate Subsurface Investigation, Inc. and observed by Green International Affiliates, Inc. between 10/07/2013 and 10/10/2013.
3. Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
4. Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
5. Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
6. Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
7. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106bor.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
BORING SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 17 OF 45

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

Peru
STP SCRP(4)

Boring No.: **B-101**
Page No.: 1 of 1
Pin No.: 07b106
Checked By: ASP

Boring Crew: Roger Burn, TT
Date Started: 6/05/14 Date Finished: 6/05/14
VTSPG NAD83: N 9936.08 ft E 50213.63 ft
Station: 10+28.60 Offset: 3.0L
Ground Elevation: 1945.62 ft

	Casing	Sampler
Type:	Flushwall	SPT
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Safety	
Rig:	D-50	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
06/15/14		Dry , after drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-4, SiSa, Rec. = 1.17 ft, 2-inches topsoil over Fill	6-10-8-16 (18)	23.2	18.6	44.6	36.8
		A-2-4, GrSiSa, Rec. = 0.5 ft, Fill	21-10-8-9 (18)	16.6	23.5	45.7	30.8
5		A-2-4, GrSiSa, Rec. = 1.5 ft, Fill	13-17-20-38 (37)	18.8	20.1	50.3	29.6
		A-2-4, SiSa, Rec. = 0.67 ft, Fill	20-33-50-50 (83)	13.6	4.4	68.2	27.4
10		A-1-a, SaGr, Rec. = 0.67 ft, Fill (FILL) (TILL)	13-16-43-50/3" (59)	10.7	57.9	34.5	7.6
15		A-2-4, GrSiSa, Rec. = 0.83 ft, Till	14-15-25-25 (40)	12.6	27.4	37.5	35.1
20		A-4, GrSiSa, Rec. = 1.0 ft, Till	26-40-39-42 (79)	12.2	23.3	38.7	38.0
		Hole stopped @ 22.0 ft					
25							
30							
35							
40							
45							

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

2010.CORV J114528.GPJ VERMONT AOT.GDT 7/2/14

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

Peru
STP SCRP(4)

Boring No.: **B-102**
Page No.: 1 of 1
Pin No.: 07b106
Checked By: ASP

Boring Crew: Roger Burn, TT
Date Started: 6/05/14 Date Finished: 6/05/14
VTSPG NAD83: N 10003.10 ft E 50224.48 ft
Station: 10+75.40 Offset: 4.0L
Ground Elevation: 1973.85 ft

	Casing	Sampler
Type:	Flushwall	SPT
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Safety	
Rig:	D-50	C_E = 1.3

Groundwater Observations

Date	Depth (ft)	Notes
06/15/14		Dry , after drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-1-B, SiGrSa, Rec. = 0.83 ft, 4-inches topsoil over Fill	1-4-13-20 (17)	13.6	27.1	47.9	25.0
		A-2-4, SiGrSa, Rec. = 0.5 ft, Fill	20-16-26-16 (42)	11.2	28.7	43.5	27.8
5		Rec. = 0.0 ft, 4.0 ft - 6.0 ft, boulders from 5 to 14 feet, Fill	12-10-3-3 (13)				
		A-2-4, SiSa, Rec. = 0.33 ft, broken rock, wood pieces, Fill	28-29-18-10 (47)	15.8	13.5	53.5	33.0
		A-1-B, SaGr, Rec. = 0.67 ft, Fill	22-15-20-21 (35)	8.1	50.8	32.1	17.1
10							
15		A-2-4, GrSiSa, Rec. = 1.0 ft, Fill	4-5-8-15 (13)	29.8	23.4	41.5	35.1
20		Organic silt with broken rock, Fill, Rec. = 1.2 ft	9-5-6-11 (11)	93.7			
25		Silt with organic matter and broken rock, Fill, Rec. = 0.33 ft	39-60/6" (60+)	29.4			
30		A-4, GrSaSi, Rec. = 0.83 ft, Fill (FILL) (TILL)	30-40-40-57 (80)	14.1	29.6	34.2	36.2
35		A-2-4, SaSiGr, Rec. = 0.07 ft, Till	46-80-50/1" (130+)	12.7	38.2	28.4	33.4
40		A-2-4, SaSiGr, Rec. = 0.5 ft, Till	51-100/5" (100+)	13.8	36.8	30.2	33.0
45		A-1-B, SiSaGr, Rec. = 0.2 ft, Till	100/3"	18.1	39.5	38.4	22.1
		Hole stopped @ 45.3 ft					

Notes:
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Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

2010.CORV J114528.GPJ VERMONT AOT.GDT 7/2/14

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

Peru
STP SCRP(4)

Boring No.: **B-103**
Page No.: 1 of 1
Pin No.: 07b106
Checked By: ASP

Boring Crew: Peter Labossion, TT
Date Started: 6/04/14 Date Finished: 6/04/14
VTSPG NAD83: N 10089.25 ft E 50229.26 ft
Station: 11+84.40 Offset: 0.0R
Ground Elevation: 1988.78 ft

	Casing	Sampler
Type:	Flushwall	SPT
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Cathead	
Rig:	B-47	C_E = 1.0

Groundwater Observations

Date	Depth (ft)	Notes
06/14/14		Dry , after drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		8-inches bituminous asphalt pavement					
		A-1-B, SaGr, Rec. = 0.67 ft, Fill	16-26-29-31 (55)	4.7	53.4	28.0	18.6
		A-2-4, SiSaGr, Rec. = 0.67 ft, Fill (IMPORTED FILL) (FILL)	26-24-16-18 (40)	7.7	39.1	30.6	30.3
5		A-4, GrSaSi, Rec. = 1.0 ft, Fill	11-16-20-20 (36)	11.8	26.0	34.9	39.1
		A-4, GrSaSi, Rec. = 0.83 ft, drill rig rocking and grinding noises, Fill	20-34-60-75 (94)	9.9	28.1	35.4	36.5
10		A-4, SaSi, Rec. = 1.17 ft, drill rig rocking and grinding noises, Fill	35-39-40-44 (79)	11.4	18.8	39.2	42.0
15		A-2-4, GrSiSa, Rec. = 1.0 ft, Fill	38-42-50-60 (92)	11.5	28.2	40.0	31.8
20		A-1-B, SaGr, Rec. = 0.33 ft, Fill	14-12-14-11 (26)	9.1	48.7	32.0	19.3
25		A-2-4, GrSiSa, Rec. = 0.5 ft, Fill (FILL) (TILL)	5-5-6-8 (11)	16.5	31.8	34.5	33.7
30		A-1-B, SiSaGr, Rec. = 1.0 ft, Till	16-36-41-39 (77)	12.6	41.8	38.0	20.2
35		A-1-B, SiSaGr, Rec. = 0.83 ft, Till	16-16-16-17 (32)	11.2	46.3	29.2	24.5
		Hole stopped @ 36.0 ft					
40							
45							

Notes:
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3. Water level readings have been made at times and under conditions stated.
Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

2010.CORV J114528.GPJ VERMONT AOT.GDT 7/2/14

NOTE: HORIZONTAL AND VERTICAL DATUMS ARE ASSUMED. REFER TO TIE SHEETS FOR HORIZONTAL AND VERTICAL CONTROL

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106bor.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
BORING SHEET 2

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 18 OF 45

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

Peru
STP SCRP(4)

Boring No.: B-104
Page No.: 1 of 1
Pin No.: 07b106
Checked By: ASP

Boring Crew: Peter Labossion, TT
Date Started: 6/03/14 Date Finished: 6/03/14
VTSPG NAD83: N 10216.83 ft E 50183.59 ft
Station: 13+11.80 Offset: 0.0R
Ground Elevation: 1991.36 ft

	Casing	Sampler
Type:	Flushwall	SPT
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Cathead	
Rig: B-47	C_E = 1.0	

Groundwater Observations

Date	Depth (ft)	Notes
06/13/14		Dry , after drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		2-inches asphalt pavement					
		A-2-4, SiGrSa, Rec. = 0.67 ft, Fill	10-7-3-5 (10)	9.7	29.0	42.6	28.4
		Rec. = 0.2 ft, 2.5 ft - 4.5 ft, Fill	11-10-12-14 (22)	6.2			
5		A-2-4, SiGrSa, Rec. = 0.83 ft, Fill	9-12-11-15 (23)	10.8	34.0	39.6	26.4
		(FILL)					
		A-2-4, GrSiSa, Rec. = 1.17 ft, drill rig rocking and grinding noises, Till (TILL)	21-25-40-25 (63)	15.1	23.3	42.8	33.9
10		A-2-4, SiGrSa, Rec. = 1.0 ft, Till	19-19-27-27 (46)	11.5	30.3	43.8	25.9
15		A-2-4, SaGrSi, Rec. = 0.67 ft, Till	30-30-43-52 (73)	10.6	33.9	31.0	35.1
		Tough drilling at 18 feet					
20		A-2-4, GrSiSa, Rec. = 0.25 ft, Till	22-32-37-56 (69)	20.9	32.0	35.1	32.9
25		A-2-4, GrSiSa, Rec. = 1.17 ft, Till, weathered shale in the tip	38-38-42-52 (80)	12.6	28.0	37.6	34.4
30		Weathered shale, Rec. = 0.0 ft	50/1" (50+)				
		Hole stopped @ 29.1 ft					
35							
40							
45							

Notes:
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3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH SECTION
SUBSURFACE INFORMATION

BORING LOG

Peru
STP SCRP(4)

Boring No.: B-105
Page No.: 1 of 1
Pin No.: 07b106
Checked By: ASP

Boring Crew: Peter Labossion, TT
Date Started: 6/03/14 Date Finished: 6/03/14
VTSPG NAD83: N 10298.35 ft E 50147.43 ft
Station: 14+25.00 Offset: 1.1R
Ground Elevation: 1997.41 ft

	Casing	Sampler
Type:	Flushwall	SPT
I.D.:	4 in	2 in
Hammer Wt:	300 lb.	140 lb.
Hammer Fall:	30 in.	30 in.
Hammer/Rod Type:	Cathead	
Rig: B-47	C_E = 1.0	

Groundwater Observations

Date	Depth (ft)	Notes
06/13/14		Dry , after drilling

Depth (ft)	Strata (1)	CLASSIFICATION OF MATERIALS (Description)	Blows/6" (N Value)	Moisture Content %	Gravel %	Sand %	Fines %
		A-1-B, SiGrSa, Rec. = 0.83 ft, Fill	11-15-18-16 (33)	7.9	39.4	39.6	21.0
		A-2-4, SiGrSa, Rec. = 1.0 ft, Fill	12-20-40-42 (60)	11.1	34.1	39.5	26.4
		(FILL)					
5		A-4, SiSa, Rec. = 1.17 ft, drill rig rocking and grinding noises, Till (TILL)	24-40-34-38 (74)	13.6	17.4	41.9	40.7
		A-4, GrSaSi, Rec. = 1.0 ft, Till	42-34-40-38 (74)	14.3	21.3	38.2	40.5
10		A-2-4, SaSiGr, Rec. = 0.67 ft, roller bit grinding on cobbles/gravel, Till	16-16-30-47 (46)	10.8	40.6	29.3	30.1
15		A-2-4, SiSaGr, Rec. = 0.67 ft, Till	30-30-29-39 (58)	11.4	35.0	33.4	31.6
20		A-4, GrSaSi, Rec. = 1.0 ft, Till	24-45-42-45 (87)	10.8	23.5	36.7	39.8
25		A-4, GrSaSi, Rec. = 1.0 ft, Till	23-29-32-44 (61)	10.9	21.8	37.0	41.2
30		A-4, GrSaSi, Rec. = 1.0 ft, Till	38-40-80/5" (120+)	11.4	25.7	32.7	41.6
		Hole stopped @ 30.4 ft					
35							
40							
45							

Notes:
1. Stratification lines represent approximate boundary between material types. Transition may be gradual.
2. N Values have not been corrected for hammer energy. C_E is the hammer energy correction factor. C_E is an estimated value.
3. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.
4. Ground surface elevations indicated on the boring logs were estimated based on the grading plan provided by VAOT.

Terracon

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NOTE: HORIZONTAL AND VERTICAL DATUMS ARE ASSUMED. REFER TO TIE SHEETS FOR HORIZONTAL AND VERTICAL CONTROL

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

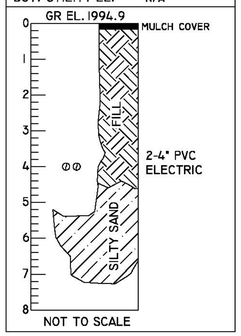
PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106bor.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
BORING SHEET 3

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 19 OF 45

QUALITY LEVEL A VACUUM EXCAVATION
TP-1

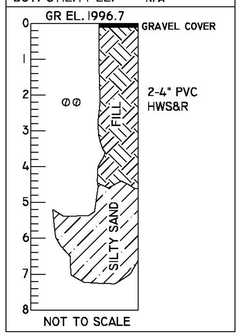
GROUND EL.	1994.9
MEASURE DOWN TOP	-4.0'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1990.9
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-2

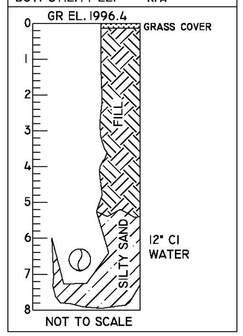
GROUND EL.	1996.7
MEASURE DOWN TOP	-2.1'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1994.6
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-3

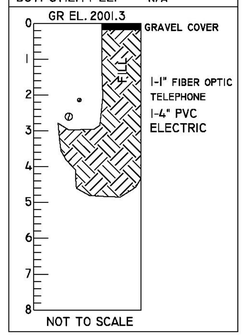
GROUND EL.	1996.4
MEASURE DOWN TOP	-6.3'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1990.1
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-4

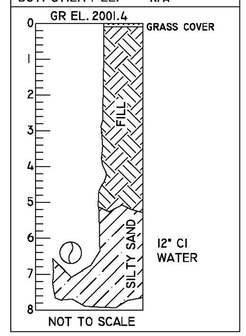
GROUND EL.	2001.3
MEASURE DOWN TOP	-2.5'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1998.8
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-5

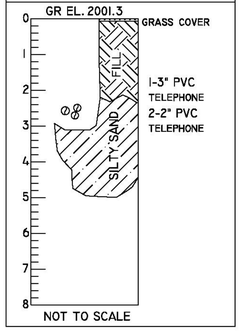
GROUND EL.	2001.4
MEASURE DOWN TOP	-6.1'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1995.3
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-6

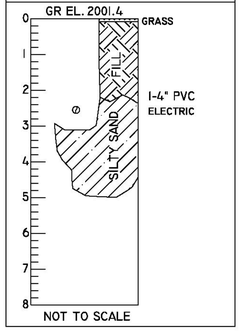
GROUND EL.	2001.3
MEASURE DOWN TOP	-2.5'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1998.8
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-7

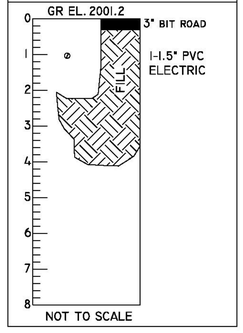
GROUND EL.	2001.4
MEASURE DOWN TOP	-2.5'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1998.9
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-8

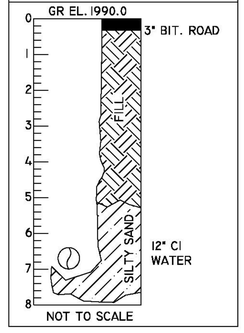
GROUND EL.	2001.2
MEASURE DOWN TOP	-1.0'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	2000.2
BOT. UTILITY EL.	N/A



NOT TO SCALE

QUALITY LEVEL A VACUUM EXCAVATION
TP-9

GROUND EL.	1990.0
MEASURE DOWN TOP	-6.1'
MEASURE DOWN BOT.	N/A
TOP UTILITY EL.	1983.9
BOT. UTILITY EL.	N/A



NOT TO SCALE

NOTE: HORIZONTAL AND VERTICAL DATUMS ARE ASSUMED. REFER TO TIE SHEETS FOR HORIZONTAL AND VERTICAL CONTROL

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106bor.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
BORING SHEET 4	SHEET 20 OF 45

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES							TOTALS		DESCRIPTIONS			
ROADWAY	ROADWAY (NO FEDERAL/STATE	LANDSCAPING (NO FEDERAL/STA	EROSION CONTROL	EROSION CONTROL (NO FEDERAL/STA	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
1						1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10	-
500						500		CY	COMMON EXCAVATION	203.15	5
15						15		CY	SOLID ROCK EXCAVATION	203.16	EST
25	75					100		CY	TRENCH EXCAVATION OF EARTH	204.20	4
1						1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22	-
4400	400					4800		CY	STRUCTURE EXCAVATION	204.25	4
730	70					800		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	77
725						725		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	4
400						400		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	66
10						10		CY	AGGREGATE SHOULDERS, IN PLACE	402.10	3
10						10		CWT	EMULSIFIED ASPHALT	404.65	0.1
1						1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50	-
66						66		CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34	0.4
15000						15000		LB	REINFORCING STEEL, LEVEL I	507.11	5
5						5		GAL	WATER REPELLENT, SILANE	514.10	0.9
220						220		CY	CONTROLLED DENSITY (FLOWABLE) FILL	541.45	16
									BEGIN OPTION AA		
30						30		LF	12" CAAP .060 (2-2/3 X 1/2)	601.0205	1
30						30		LF	12" PCCSP .064 (2-2/3 X 1/2)	601.0405	1
30						30		LF	12" RCP CLASS III	601.0805	1
30						30		LF	12" CPEP(SL)	601.2605	1
									END OPTION AA		
									BEGIN OPTION BB		
350						350		LF	72 CAAP .105 (3 X 1)	601.0342	8
350						350		LF	72" PCCSP .109 (3 X 1)	601.0542	8
									END OPTION BB		
									BEGIN OPTION CC		
	90					90		LF	24" CAAP .060 (2-2/3 X 1/2)	601.0225	4
	90					90		LF	24" PCCSP .064 (2-2/3 X 1/2)	601.0425	4
	90					90		LF	24" RCP CLASS III	601.0825	4
	90					90		LF	24" CPEP(SL)	601.2620	4
									END OPTION CC		
									BEGIN OPTION DD		
	55					55		LF	72 CAAP .105 (3 X 1)	601.0342	-
	55					55		LF	72" PCCSP .109 (3 X 1)	601.0542	-
									END OPTION DD		
10						10		LF	42" PCCSP .109 (2-2/3 X 1/2)	601.0452	-
2						2		EACH	42" PCCSP ELBOW .109 (2-2/3 X 1/2)	601.5456	-
5						5		EACH	PRECAST REINFORCED CONCRETE MANHOLE WITH CAST IRON COVER (10' DIA.) (<= 25 FOOT DEPTH)	604.21	-

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
COMMON EXCAVATION		
495	CY	VT ROUTE 11
5	CY	ROUNDING
500	CY	TOTAL
TRENCH EXCAVATION OF EARTH		
96	CY	MEASURED
4	CY	ROUNDING
100	CY	TOTAL
STRUCTURE EXCAVATION		
4796	CY	MEASURED
4	CY	ROUNDING
4800	CY	TOTAL
GRANULAR BACKFILL FOR STRUCTURES		
723	CY	MEASURED
77	CY	ROUNDING
800	CY	TOTAL
SUBBASE OF DENSE GRADED CRUSHED STONE		
334	CY	VT ROUTE 11
66	CY	ROUNDING
400	CY	TOTAL
PERMANENT EROSION CONTROL		
40	CY	STONE FILL, TYPE I
70	CY	STONE FILL, TYPE II
1550	SY	GEOTEXTILE UNDER STONE FILL
50	LB	SEED

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106qty.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
QUANTITY SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 21 OF 45

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES							TOTALS		DESCRIPTIONS			
ROADWAY	ROADWAY (NO FEDERAL/STATE	LANDSCAPING (NO FEDERAL/STA	EROSION CONTROL	EROSION CONTROL (NO FEDERAL/STA	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND
2						2		EACH	PRECAST REINFORCED CONCRETE MANHOLE WITH CAST IRON COVER (10' DIA.) (> 25 FOOT DEPTH)	604.21	-
1						1		EACH	REHAB. DROP INLETS, CATCH BASINS, OR MANHOLES, CLASS II	604.415	-
20						20		MGAL	DUST CONTROL WITH WATER	609.10	4
			40			40		CY	STONE FILL, TYPE I	613.10	2
			70			70		CY	STONE FILL, TYPE II	613.11	3
150						150		LF	TREATED TIMBER CURB	616.35	28
30						30		LF	REMOVING AND RESETTING CURB	616.40	4
9						9		EACH	YIELDING MARKER POSTS	619.17	-
45						45		LF	CHAIN-LINK FENCE, 4 FEET	620.11	4
70						70		LF	REMOVING AND RESETTING FENCE	620.50	5
275						275		LF	REMOVE AND RESET GUARDRAIL	621.75	25
300						300		LF	TEMPORARY TRAFFIC BARRIER	621.90	38
300						300		LF	REMOVE AND RESET TEMPORARY TRAFFIC BARRIER	621.95	46
40						40		LF	PVC SEWER PIPE (8")	628.35	1.5
1						1		LS	TRANSFER TO NEW SYSTEM, SANITARY SEWER	628.42	-
70						70		LF	DUCTILE IRON PIPE, CEMENT-LINED (12")	629.24	4
1						1		LS	TRANSFER TO NEW SYSTEM, WATER SYSTEM	629.42	-
850	100					950		TON	CRUSHED STONE BEDDING	629.54	35
128						128		HR	UNIFORMED TRAFFIC OFFICERS	630.10	EST
400						400		HR	FLAGGERS	630.15	EST
					1	1		LS	FIELD OFFICE, ENGINEERS	631.10	-
					3000	3000		DL	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.26	-
1						1		LS	MOBILIZATION/DEMOBILIZATION (PARTICIPATING)	635.11	-
1						1		LS	TRAFFIC CONTROL	641.10	-
120						120		DAY	PORTABLE CHANGEABLE MESSAGE SIGN RENTAL	641.17	EST
700						700		LF	DURABLE 4 INCH WHITE LINE, THERMOPLASTIC	646.402	33
1100						1100		LF	DURABLE 4 INCH YELLOW LINE, THERMOPLASTIC	646.412	16
300						300		LF	DURABLE 6 INCH YELLOW LINE, THERMOPLASTIC	646.432	12
3000						3000		LF	TEMPORARY 4 INCH WHITE LINE, PAINT	646.602	18
3250						3250		LF	TEMPORARY 4 INCH YELLOW LINE, PAINT	646.612	10
1050						1050		LF	TEMPORARY 6 INCH YELLOW LINE, PAINT	646.632	42
40						40		LF	TEMPORARY 24 INCH STOP BAR, PAINT	646.682	4
560						560		SF	REMOVAL OF EXISTING PAVEMENT MARKINGS	646.85	7
680						680		SF	PAVEMENT MARKING MASK	646.86	1
			1550			1550		SY	GEOTEXTILE UNDER STONE FILL	649.31	49
			50			50		SY	GEOTEXTILE FOR FILTER CURTAIN	649.61	14
			25	25		50		LB	SEED	651.15	37
			25	25		50		LB	SEED, WINTER RYE	651.17	37
			50	50		100		LB	FERTILIZER	651.18	46
			0.2	0.1		0.3		TON	AGRICULTURAL LIMESTONE	651.20	0.09

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
TEMPORARY EROSION CONTROL		
50	SY	GEOTEXTILE FOR FILTER CURTAIN
50	LB	SEED, WINTER RYE
0.3	TON	HAYMULCH
200	SY	TEMPORARY EROSION MATTING

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106qty.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
QUANTITY SHEET 2

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 22 OF 45

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 3

SUMMARY OF ESTIMATED QUANTITIES

ROADWAY	ROADWAY (NO FEDERAL/STATE	LANDSCAPING (NO FEDERAL/STA	EROSION CONTROL	EROSION CONTROL (NO FEDERAL/STA	FULL C.E. ITEMS
			0.2	0.1	
			20	10	
			1		
			200		
			1		
			200		
			80		
			600		
			1025	400	
		3			
		9			
		7			
		4			
		5			
		12			
36					
7					
7					
	500				
	6				
	150				
1					
1					
1	1				
		1			
1					
1					
1					
1					
		1050			
10					
460					

TOTALS

GRAND TOTAL	FINAL
0.3	
30	
1	
200	
1	
200	
80	
600	
1425	
3	
9	
7	
4	
5	
12	
36	
7	
7	
500	
6	
150	
1	
1	
2	
1	
1	
1	
1	
1	
1050	
10	
460	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER	ROUND
TON	HAY MULCH	651.25	0.09
CY	TOPSOIL	651.35	1
LS	EPSC PLAN	652.10	-
HR	MONITORING EPSC PLAN	652.20	EST
LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30	-
SY	TEMPORARY EROSION MATTING	653.20	10
CY	VEHICLE TRACKING PAD	653.35	EST
LF	BARRIER FENCE	653.50	50
LF	PROJECT DEMARCATION FENCE	653.55	35
EACH	EVERGREEN TREES (ABIES BALSAMEA)(BALSAM FIR)(B&B)(7-8 FEET)	656.20	-
EACH	DECIDUOUS SHRUBS (CLETHRA ALNIFOLIA 'HUMINGBIRD')(HUMMING BIRD SUMMERSWEET)(CONT)(2-2.5 FEET)	656.35	-
EACH	DECIDUOUS SHRUBS (CORNUS ALBA 'ARGENTEO-MARGINALA')(VARIGATED RED TWIG DOGWOOD)(B&B)(3-4 FEET)	656.35	-
EACH	DECIDUOUS SHRUBS (JUNIPERUS CHINENSIS 'SEA GREEN')(SEAGREEN JUNIPER)(CONT)(2-2.5 FEET)	656.35	-
MGAL	LANDSCAPE WATERING	656.65	0.5
CY	LANDSCAPE BACKFILL, TRUCK MEASUREMENT	656.80	0.2
LF	SQUARE TUBE SIGN POST AND ANCHOR	675.341	EST
EACH	REMOVING SIGNS	675.50	-
EACH	ERECTING SALVAGED SIGNS	675.60	-
LF	ELECTRICAL CONDUIT (4") (PVC)	678.21	17
EACH	PULL BOX, STANDARD	678.25	-
LF	ELECTRICAL CONDUIT SLEEVE (8") (PVC)	678.30	1
EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40	-
LU	PRICE ADJUSTMENT, FUEL (N.A.B.I.)	690.50	-
LS	SPECIAL PROVISION (DECOMMISSION PIPE)	900.645	-
LS	SPECIAL PROVISION (LANDSCAPE AREA RESTORATION)	900.645	-
LS	SPECIAL PROVISION (STAFF GAUGE)	900.645	-
LS	SPECIAL PROVISION (STOP LOG SYSTEM)	900.645	-
LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITIY) (N.A.B.I.)	900.650	-
LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT)(N.A.B.I.)	900.650	-
SF	SPECIAL PROVISION (REMOVE AND RESET CONCRETE PAVERS)	900.670	49
SY	SPECIAL PROVISION (PORTLAND CEMENT CONCRETE ISLAND TREATMENT, 4 INCH)	900.675	2
TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680	11

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS
		SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)
394	TON	VT ROUTE 11
55	TON	BROMLEY PARKING LOT PATCHING
11	TON	ROUNDING
460	TON	TOTAL

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106qty.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
QUANTITY SHEET 3

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 23 OF 45

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

ITEM DETAIL AND DRAINAGE SHEET

	STATION	STATION	POS.	ASKEW	INLET/OUTLET TYPE		PIPE		ALLOWABLE OPTIONS				PIPE ELBOW	CB	PRCID	CONTROLLED DENSITY (FLOWABLE) FILL	CONC CLASS B	REINF STEEL	DI GRATE	CHAN ELEV	CRM	STRUCT. EXCAVATION		GRAN BKFILL STRUCT	EROS MATT	STONE FILL		MARKER POSTS		REMARKS
					INLET	OUTLET	D	L	PCCSP	CAAP	CPEP	RCP										EARTH	ROCK					LT	RT	
				NO. DEG.			IN	FT	TH	TH	SL	CLASS	NO. DEG.	EA		CY	CY	LBS	TYPE	EA	CY	CY	CY	CY	SY	CY	TYPE	EA	EA	
	EXISTING DRAINAGE																													
	CULVERT																													
1	9+60.1	9+87.3	LT-LT		PIPE	PIPE	12	36																						RETAIN AND PROTECT PIPE
2	9+85.1	10+89.9	LT-LT		PIPE	CB	15	58																						RETAIN PIPE AND STRUCTURE
3	10+70.9	12+57.5	LT-LT		PIPE	PIPE	24	140																						RETAIN AND PROTECT PIPE
4	9+92.7	14+82.6	LT-LT		PIPE	MH	42	450														333								ABANDON DOWNSTREAM PIPE AND STRUCTURE IN PLACE PER SPECIAL PROVISION (DECOMMISSION PIPE)
5	14+82.6	16+00.0	LT-LT		MH	PIPE	42	116																						RETAIN PIPE AND STRUCTURE
6	11+26.2	11+45.5	RT-RT		MH	PIPE	15	27																						RETAIN PIPE AND PROTECT AND ADJUST STRUCTURE
7	14+22.6	14+50.6	LT-LT		MH	PIPE	12	125																						REMOVE PIPE AND CONNECT TO NEW 10' DIAMETER MH
8	14+50.6	14+43.2	RT-RT		MH	PIPE	24	60																						RETAIN PIPE AND STRUCTURE
9	10+45.5	9+50.0	RT-RT		MH	PIPE	42	269																						REMOVE UPSTREAM 20' OF EXISTING PIPE
10	14+07.1	UNK	LT-LT		DI	PIPE	12	-																						ABANDON EXISTING 12" PIPE, BULKHEAD MANHOLE, RETAIN DI SEE (11)
	PROPOSED DRAINAGE																													
	CULVERT																													
1	14+82.6	14+22.6	LT-LT		MH	MH	72	55	~~.109~~	.105												548		83				2		NEW PIPE FROM NEW MH @ 14+22.6 TO ~~EXISTING~~ MH @ 14+82.6
2	14+22.6	13+14.3	LT-LT		MH	MH	72	98	~~.109~~	.105												827		129				1		NEW PIPE AND NEW MH @ 14+22.6 SEE PIPE INSTALLATION NOTES FOR ADDITIONAL
3	13+14.3	12+06.1	LT-LT		MH	MH	72	98	~~.109~~	.105												857		141				-		NEW PIPE AND NEW MH @ 13+14.3
4	12+06.1	11+30.4	LT-LT		MH	MH	72	66	~~.109~~	.105												623		310				1		NEW PIPE AND NEW MH @ 12+06.1
5	11+30.4	10+85.0	LT-LT		MH	MH	72	35	~~.109~~	.105												479		70	129			1		NEW PIPE AND NEW MH @ 11+30.4
6	10+85.0	10+50.7	LT-LT		MH	MH	72	24	~~.109~~	.105												472		78	34			1		NEW PIPE AND NEW MH @ 10+85.0
7	10+50.7	10+26.4	LT-LT		MH	MH	72	14	~~.109~~	.105												279		44	27			1		NEW PIPE AND NEW MH @ 10+50.7
8	10+26.4	10+14.9	LT-LT		MH	HW	72	7	~~0.109~~	0.105							66	14874				322		63		67	II			NEW PIPE AND NEW MH @ 10+26.4, CONSTRUCT NEW CONCRETE HEADWALL, WINGWALLS, AND FOOTING @ 10+14.9
9	10+24.5	10+12.1	RT-RT		MH	PIPE	42	10	~~.109~~	.109			45/45									TRENCH EXCAVATION								CONNECT EXISTING PIPE TO NEW MH USING PIPE ELBOWS @ 10+50.7
10	14+22.6	14+50.6	RT-RT		DI	MH	24	86	~~.064~~	~~.06~~	SL	~~III~~										75						1		CONNECT NEW PIPE TO NEW MH @ 14+22.6
11	14+07.1	14+22.6	LT-LT		DI	MH	12	29	~~.064~~	~~.06~~	SL	~~III~~				2						21						1		CONNECT NEW PIPE TO NEW MH @ 14+22.6 SEE PIPE INSTALLATION NOTES FOR ADDITIONAL REQUIREMENTS
	TOTALS						72	397	PCCSP 0.109 (3"x1")/CAAP 0.105 (3"x1")							2	66	14874				**STRUCT. EX.**	**4740**							
							42	10	PCCSP 0.109 (2-2/3"-1/2")													**TRENCH EX.**	**96**							
							24	86	PCCSP 0.064 (2-2/3"-1/2")/CAAP 0.06 (2-2/3"-1/2")/CPEP (SL)/RCP CLASS III															**918**	**190**	**67**			**9**		
							12	29	PCCSP 0.064 (2-2/3"-1/2")/CAAP 0.06 (2-2/3"-1/2")/CPEP (SL)/RCP CLASS III																					

GUARDRAIL

BEGIN STATION	END STATION	POSITION LEFT FT	POSITION RIGHT FT	END TREATMENT LEFT FT	END TREATMENT RIGHT FT
REMOVE AND ~~RESET~~ GUARDRAIL					
	REPLACE				
TOTALS					

TREATED TIMBER CURB

BEGIN STATION	END STATION	POSITION LEFT FT	POSITION RIGHT FT	REMARKS
SEE ROADWAY LAYOUT SHEET FOR LOCATION				

VT ROUTE 11

32+97.7	34+16.7	122		
TOTALS		122		

UNDERDRAIN

BEGIN STATION	END STATION	POSITION	TYPE	DIA IN.	LENGTH FT	TRENCH EARTH CY.	TRENCH ROCK CY.	GRAN BKFILL CF	FB EA	MRK. POST EA
TOTALS										

*NOTE: IT IS ANTICIPATED THAT 75% OF IN-SITU MATERIAL CAN BE REUSED; THEREFORE THE GRANULAR BACKFILL FOR STRUCTURES IS 25% OF THE CALCULATED BACKFILL

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b1061temdet.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
ITEM DETAIL & DRAINAGE SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EARTHWORKS

STATION	DIST FT.	TOTAL EXCAVATION EARTH AND ROCK AREA S.F.	TOTAL EXCAVATION EARTH AND ROCK VOLUME C.Y.	ROCK EXCAVATION AREA S.F.	ROCK EXCAVATION VOLUME C.Y.	EMBANKMENT AREA S.F.	EMBANKMENT VOLUME C.Y.		
VERMONT ROUTE 11									
32+65		0				0			
	33		22				0		
32+98		36				0			
	2		4				0		
33+00		63				0			
	50		192				0	CUT	428
33+50		145				0		ROCK	13
	50		190				0	R.FAC	0.495
34+00		60				0		FILL	0
	17		19				0	F.FAC	1.15
34+17		0						EX. C	428
STONE FILL, TYPE II OUTLET PROTECTION									
10+10		907	67			0		CUT	67
								ROCK	2
								R.FAC	0.495
								FILL	0
								F.FAC	1.15
								EX. C	67

SUMMARY AND BALANCES

STATION TO STATION		TOT EXC. EARTH & ROCK C.Y.	ROCK EXCAV C.Y.	EMBANK C.Y.	EXCESSES CUT	EXCESSES FILL	ACUMULATIVE EXCESSES CUT	ACUMULATIVE EXCESSES FILL
PERU STP SCRP(4)								
32+48	34+67	428	-	0	428	-	428	-
9+89	10+13	67	-	0	67	-	495	-
3% CONTINGENCY		-	15	-	15	-	510	-
SUB-TOTAL		495	15	0	510	0	510	-
TOTAL		495	15	0	510	0	510	-

REMARKS

EARTH AND ROCK EXCAVATION	510
SOLID ROCK EXCAVATION	15
EARTH EXCAVATION	495
BACKFILL FOR TRENCH EXCAVATION (CB AND PIPES)	
PLANIMETERED FILL	0
LESS FACTORED SOLID ROCK	0
LESS DISPLACEMENT OF ANY LARGE STRUCTURES	0
NET PLANIMETERED FILL	0
FACTOR	1.15
PLANIMETERED FILL INCLUDING FACTOR	0
MATERIALS AVAILABLE FOR FILLS	
EARTH EXCAVATION (COMMON)	495
CHANNEL EXCAVATION	0
UNDERDRAIN EXCAVATION	0
STRUCTURE EXCAVATION (see note 1)	4740
TRENCH EXCAVATION FOR DRAINAGE (see note 2)	95
TRENCH EXCAVATION OF ROCK	0
TOTAL MATERIAL AVAILABLE FOR FILL	4145
TOTAL MATERIAL FOR FILL	4145
FILL MATERIAL REQUIRED	3650
EXCESS EXCAVATION	495

Notes:
1) 75% of Struct. Ex. is assumed to be reusable in the trench
2) All of Trench Ex. Earth is assumed to be resuable in the trench

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106ewqty.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
EARTHWORKS SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 25 OF 45

COLD PLANING, BITUMINOUS CONCRETE
32+22.7 - 32+97.7
34+16.7 - 34+91.66

AGGREGATE SHOULDERS, IN PLACE
32+47.7 - 32+97.7
34+16.7 - 34+66.7

REHAB. DROP INLETS, CATCH BASINS, OR MANHOLES, CLASS II
14+07.1 LT

TREATED TIMBER CURB
32+97.7 LT - 34+16.7 LT

REMOVING AND RESETTING CURB
16+65.7 LT - 12+59.9 RT
12+71.9 LT - 12+66.0 RT

CHAIN LINK FENCE, 4 FEET
10+02.3 LT - 10+06.6

REMOVING AND RESETTING FENCE
14+05.0 LT - 14+22.6 RT
14+51.3 LT - 14+58.8 RT

STONE FILL, TYPE II
9+64.4 LT - RT - 10+26.9 LT - RT

REMOVE AND ~~RESET~~ REPLACE GUARDRAIL
32+94.6 RT - 34+19.6 RT
32+94.6 LT - 34+19.6 LT

EXISTING RAIL WAS IN POOR CONDITION

SPECIAL PROVISION (PORTLAND CEMENT CONCRETE ISLAND TREATMENT, 4 INCH)
12+59.9 RT - 12+71.9 LT

SPECIAL PROVISION (REMOVE AND RESET CONCRETE PAVERS
13+28.6 RT - 14+17.9 RT

SPECIAL PROVISION (LANDSCAPE AREA RESTORATION)
13+35.5 RT - 13+97.3 RT

SPECIAL PROVISION (STAFF GAUGE)
10+26.4 - 1 LUMP SUM

NOTES:

1. SEE TRAFFIC SIGNS AND MARKINGS SHEET FOR PAVEMENT MARKING INFORMATION

2. REFER TO LANDSCAPE PLAN SHEET FOR MORE INFORMATION

3. THE WORK ADJACENT TO THE POND IS ANTICIPATED TO BE COMPLETED IN THE DRY WHEN THE POND IS DRAINED OR LOW. THE CONTRACTOR SHALL COORDINATE WITH BROMLEY SKI RESORT.

4. CONTRACTOR SHALL LEAVE EXCAVATION SUPPORT IN PLACE AND BACKFILL USING CONTROLLED DENSITY (FLOWABLE) FILL, SEE DETAILS AND PIPE INSTALLATION NOTES

EXISTING DRAINAGE (CONTINUED)

[4] 9+92.7 LT - 14+82.6 LT
EXISTING 42" PCCSP - SPECIAL PROVISION (DECOMMISSION PIPE)

[5] 14+82.6 LT - 16+00.0 LT
EXISTING 42" PCCSP - RETAIN

[6] 11+26.2 RT - 11+45.5 RT
EXISTING 15" PCCSP - RETAIN PIPE
EXISTING DI @ 11+45.5 RT - PROTECT AND ADJUST STRUCTURE

[7] 14+22.6 LT - 14+50.6 RT
EXISTING 12" CPEP - REMOVE
EXISTING DI @ 14+50.6 RT - REMODEL

[8] 14+50.6 RT - 14+43.2 RT
EXISTING 24" CPEP - RETAIN
EXISTING DI @ 14+43.2 RT - RETAIN

[9] 10+45.5 RT - 9+50.0 RT
EXISTING 42" CGMP - REMOVE 20' OF EXISTING PIPE

[10] 14+07.1 LT - UNK
ABANDON EXISTING 12" CPEP - RETAIN EXISTING DI

EXISTING DRAINAGE

[1] 9+60.1 LT - 9+87.3 LT
EXISTING 12" CPIP - RETAIN

[2] 9+85.1 LT - 10+89.9 LT
EXISTING 15" PCCSP - RETAIN
EXISTING DI @ 10+89.9 LT - RETAIN

[3] 10+70.9 LT - 12+57.5 LT
EXISTING 24" PCCSP - RETAIN

NEW DRAINAGE

[1] 14+82.6 LT - 14+22.6 LT
NEW 72" X 55' ~~PCCSP~~/CAAP PIPE
~~EXISTING~~ NEW MH @ 14+82.6

[2] 14+22.6 LT - 13+14.3 LT
NEW 72" X 98' ~~PCCSP~~/CAAP PIPE
NEW MH @ 14+22.6

[3] 13+14.3 LT - 12+06.1 LT
NEW 72" X 98' ~~PCCSP~~/CAAP PIPE
NEW MH @ 13+14.3

[4] 12+06.1 LT - 11+30.4 LT
NEW 72" X 66' ~~PCCSP~~/CAAP PIPE
NEW MH @ 12+06.1

[5] 11+30.4 LT - 10+85.0 LT
NEW 72" X 35' ~~PCCSP~~/CAAP PIPE
NEW MH @ 11+30.4

[6] 10+85.0 LT - 10+50.7 LT
NEW 72" X 24' ~~PCCSP~~/CAAP PIPE
NEW MH @ 10+85.0

[7] 10+50.7 LT - 10+26.4 LT
NEW 72" X 14' ~~PCCSP~~/CAAP PIPE
NEW MH @ 10+50.7

[8] 10+26.4 LT - 10+14.9 LT
NEW 72" X 7' ~~PCCSP~~/CAAP PIPE
NEW MH @ 10+26.4
AND HEADWALL @ 10+14.9

[9] 10+24.5 RT - 10+12.1 RT
NEW 42" X 10' PCCSP PIPE
W/ 2 PIPE ELBOWS
CONNECT TO EXISTING PIPE.

[10] 14+22.6 RT - 14+50.6 RT
NEW 24" X 86' CPEP (SL) /~~PCCSP/CAAP/RCP~~
INV (UP) = 1991.6* INV (DN) = 1990.7*

[11] 14+07.1 LT - 14+22.6 LT
NEW 12" X 29' CPEP (SL) /~~PCCSP/CAAP/RCP~~
INV (UP) = 1991.6* INV (DN) = 1991.3*
* THE PORTION OF PIPE OVER THE SKI LIFT FOOTING SHALL BE BACKFILLED USING ITEM 541.45 CONTROLLED DENSITY (FLOWABLE) FILL TO 1-FOOT OVER THE PIPE

REVISION	BY	DATE
⚠ ADDED CONSTRUCTION NOTE FOR SPECIAL PROVISION (STAFF GAUGE)	MAB	2/10/2015

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

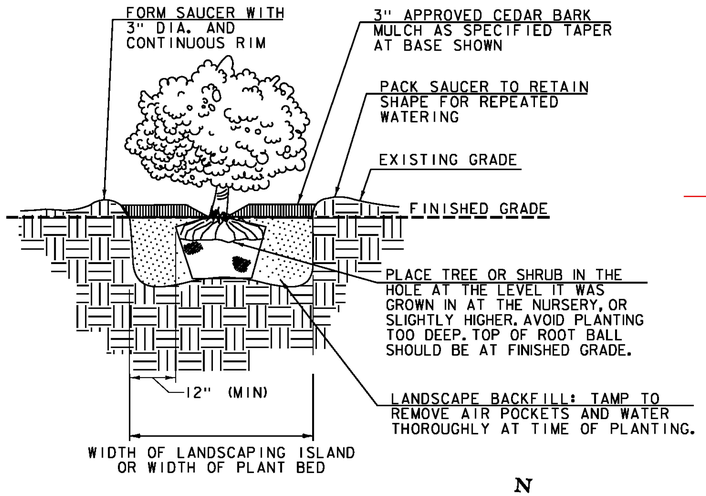
PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106bdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
PLAN SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 26 OF 45

GENERAL LANDSCAPE NOTES:

1. SEE EPSC SHEETS FOR SEEDING FORMULAS, FERTILIZER APPLICATION RATES, MULCH REQUIREMENTS ETC.
2. LANDSCAPE BACKFILL, TRUCK MEASUREMENT BACKFILL WITH PLANTING MIX OF 1/2 SCREENED TOPSOIL, 1/4 COMPOST AND 1/4 NATIVE MATERIAL AS APPROVED BY THE ENGINEER. UNSUITABLE NATIVE MATERIAL SHALL BE REPLACED WITH IMPORTED APPROVED TOPSOIL AS DIRECTED BY ENGINEER.
3. WATERING SHRUBS TO RECEIVE A MINIMUM OF 5 GALLONS AT EACH WATERING, TWICE WEEKLY DURING ESTABLISHMENT PERIOD. TREES TO RECEIVE A MINIMUM OF 10 GALLONS AT EACH WATERING, TWICE WEEKLY DURING ESTABLISHMENT PERIOD. CONTRACTORS SHALL MAINTAIN AND PROVIDE A LOG TO THE RESIDENT ENGINEER SHOWING AMOUNTS AND DATES OF WATERING AND NOTING NATURAL RAINFALL EVENTS. WATERING SCHEDULE MAY BE ADJUSTED AS APPROVED BY THE RESIDENT ENGINEER.
4. BARK MULCH SHALL BE CEDAR AND PROVIDED IN ACCORDANCE WITH SUBSECTION 755.10(C).
5. PAYMENT FOR CEDAR BARK MULCH, LANDSCAPE STONE, AND LANDSCAPE BOULDERS SHALL BE CONSIDERED INCIDENTAL TO SPECIAL PROVISION (LANDSCAPE AREA RESTORATION).



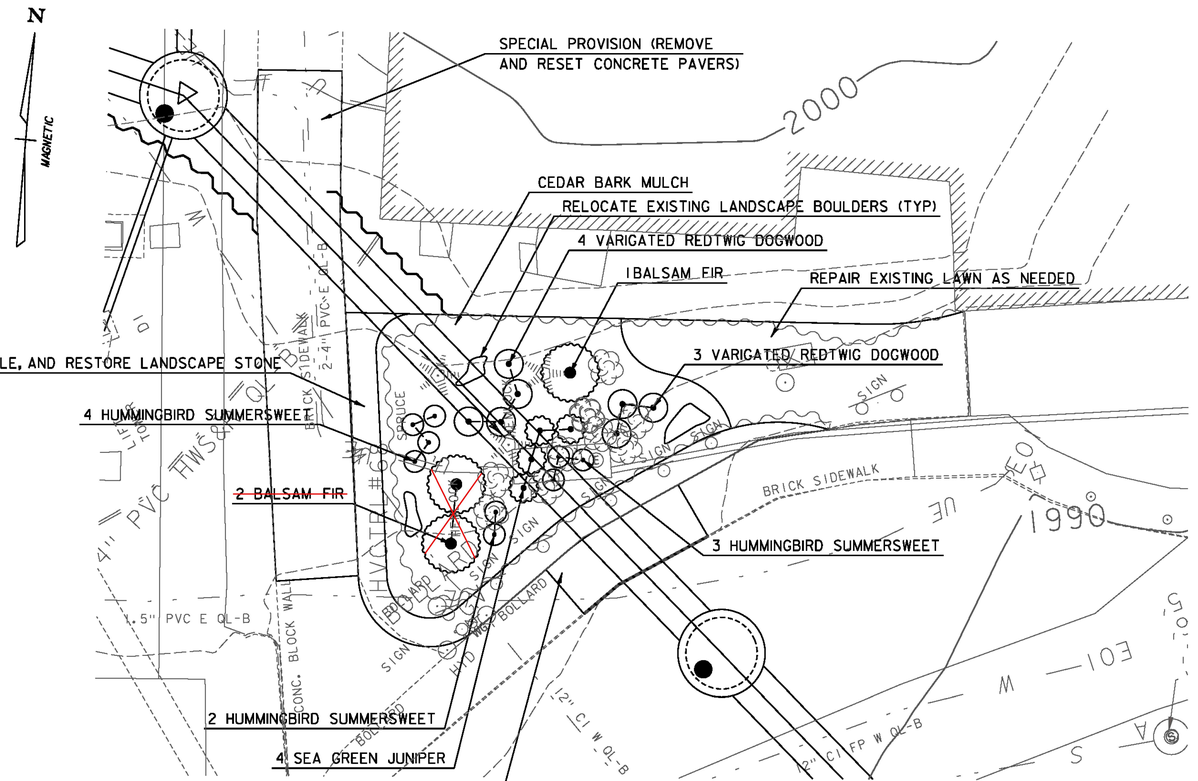
SHRUB PLANTING DETAIL

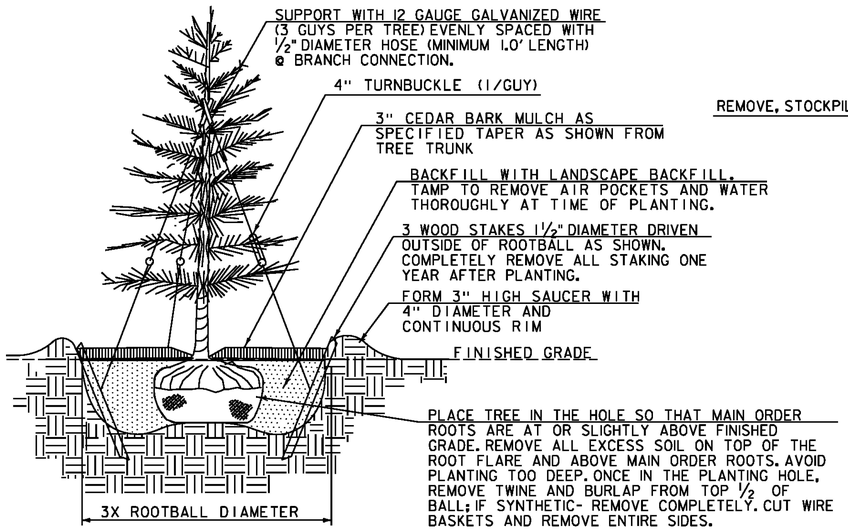
SCALE: NOT TO SCALE

PLANT LIST

QTY.	SIZE	COMMON NAME / AREA	BOTANICAL NAME	SPACING/COMMENTS
EVERGREEN TREES				
1 ~~3~~	7-8 FEET HEIGHT	BALSAM FIR	ABIES BALSAMEA	BALL AND BURLAP (B&B)
SHRUBS				
9	2-2.5 FEET SPREAD	HUMMING BIRD SUMMERSWEET	CLETHRA ALNIFOLIA 'HUMINGBIRD'	CONTAINER (CONT)
7	3-4 FEET HEIGHT	VARIGATED REDTWIG DOGWOOD	CORNUS ALBA 'ARGENTEO-MARGINALA'	BALL AND BURLAP (B&B)
4	2-2.5 FEET SPREAD	SEAGREEN JUNIPER	JUNIPERUS CHINENSIS 'SEA GREEN'	CONTAINER (CONT)

B&B = BALL AND BURLAP





EVERGREEN TREE PLANTING DETAIL

SCALE: NOT TO SCALE

NOTES:

1. ANTI-DESICCANT SPRAY IS TO BE APPLIED TO ALL EVERGREENS PER MANUFACTURER SPECIFICATIONS.
2. COMPLETELY REMOVE ALL GUY-WIRES AND TURNBUCKLE ONE YEAR AFTER PLANTING.

0 10 20

SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106landbdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: D. VERTIYEV
DESIGNED BY: J. RIEMENSCHNEIDER	CHECKED BY: E. ATKINS
LANDSCAPE PLAN SHEET	SHEET 27 OF 45

NOTES:

1.) UTILITIES CROSSING THE TRENCH SHALL BE SUPPORTED IN PLACE DURING CONSTRUCTION. PAYMENT FOR UTILITY SUPPORT SHALL BE INCIDENTAL TO THE CONTRACT.

2.) UTILITIES TO BE REPLACED SHALL BE BYPASSED DURING CONSTRUCTION. BYPASS SHALL BE PAID FOR UNDER ITEMS 628.42, TRANSFER TO NEW SYSTEM, SANITARY SEWER AND 629.42, TRANSFER TO NEW SYSTEM, WATER SYSTEM.

3.) AFTER CULVERT INSTALLATION AND BEFORE PLACEMENT OF GRANULAR BACKFILL FOR STRUCTURES, THE CONTRACTOR SHALL INSTALL NEW PIPE IN PLACE OF THE BYPASSED SYSTEM.

4.) SEE THE UTILITIES SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

~~PVC SEWER PIPE (8") (PARTICIPATING)~~
~~12+76.2 RT - 12+97.7 LT~~ NOT DONE

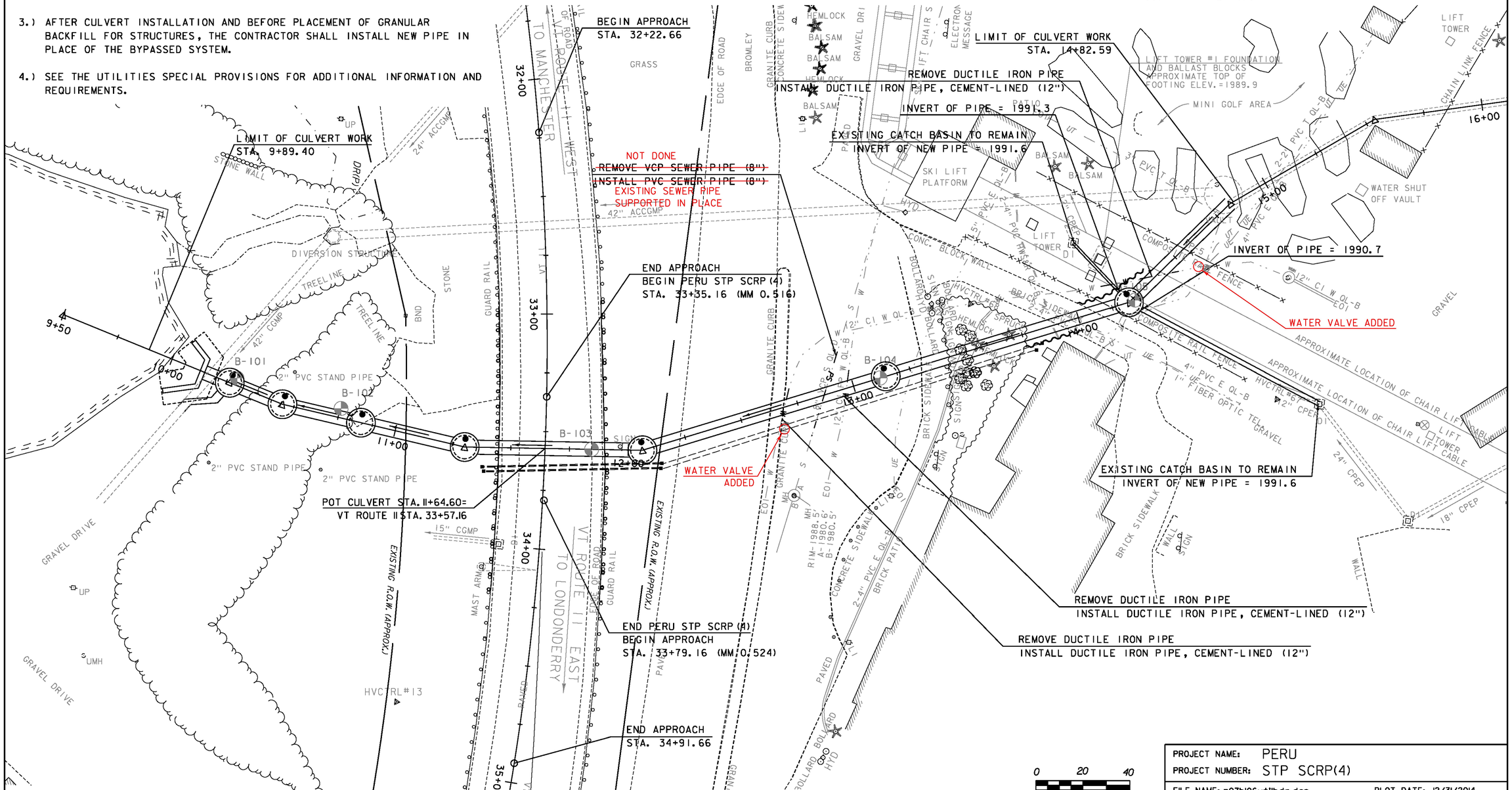
DUCTILE IRON PIPE, CEMENT-LINED (12") (PARTICIPATING)
12+66.4 RT - 12+73.4 LT
12+95.1 RT - 13+00.0 LT
14+12.9 LT - 14+47.9 RT

ELECTRICAL CONDUIT (4") (PVC) (NON-PARTICIPATING)
11+38.6 RT - 12+11.4 RT 73'
11+39.4 RT - 12+10.3 RT 71'
12+13.3 RT - 13+81.4 RT 168'
12+11.8 RT - 13+78.1 RT 166'

PULL BOX, STANDARD (NON-PARTICIPATING)
11+37.6 RT
11+38.4 RT
12+12.4 RT
12+11.3 RT
13+82.4 RT
13+79.1 RT

MAGNETIC N

ELECTRICAL CONDUIT SLEEVE (8") (PVC) (NON-PARTICIPATING)
11+38.6 RT - 12+11.4 RT 75'
11+39.4 RT - 12+10.3 RT 74'



0 20 40
SCALE IN FEET

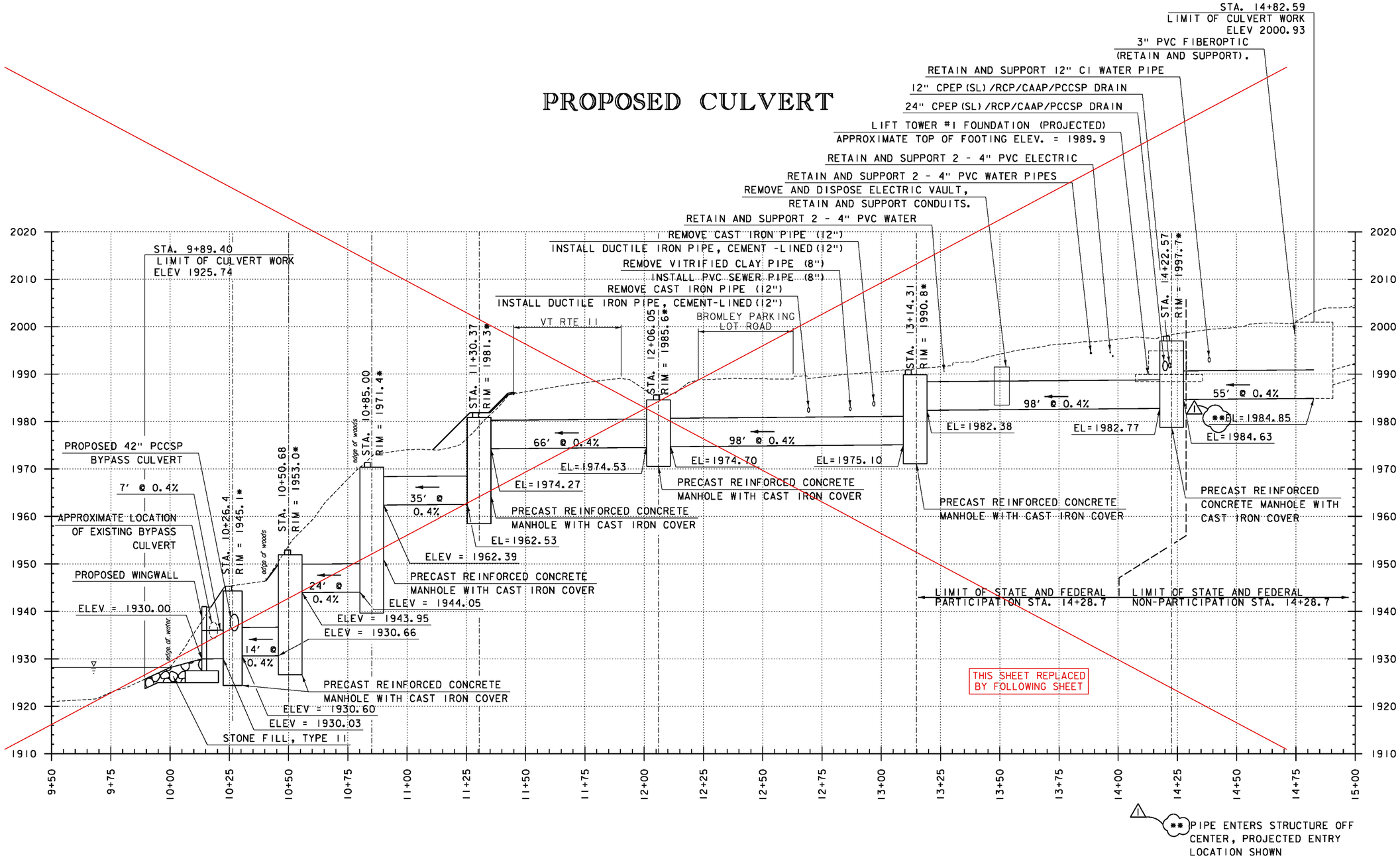
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106ut11bdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
UTILITY PLAN SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 28 OF 45

PROPOSED CULVERT



**PIPE ENTERS STRUCTURE OFF CENTER, PROJECTED ENTRY LOCATION SHOWN

REVISION	BY	DATE
⚠ SECOND ASTERISK WAS ADDED TO NOTE AND ELEVATION CALLOUT	MAB	2/10/2015

*RIM ELEVATIONS ARE APPROXIMATE AND SHALL BE ADJUSTED TO MEET THE GRADE AS NECESSARY. SEE SHEET 8 FOR ADDITIONAL REQUIREMENTS.

MANHOLE STRUCTURES ARE SHOWN PICTORIALLY FOR INFORMATION ONLY. ACTUAL SHAPE AND SIZE TO BE DETERMINED BY THE CONTRACTOR.

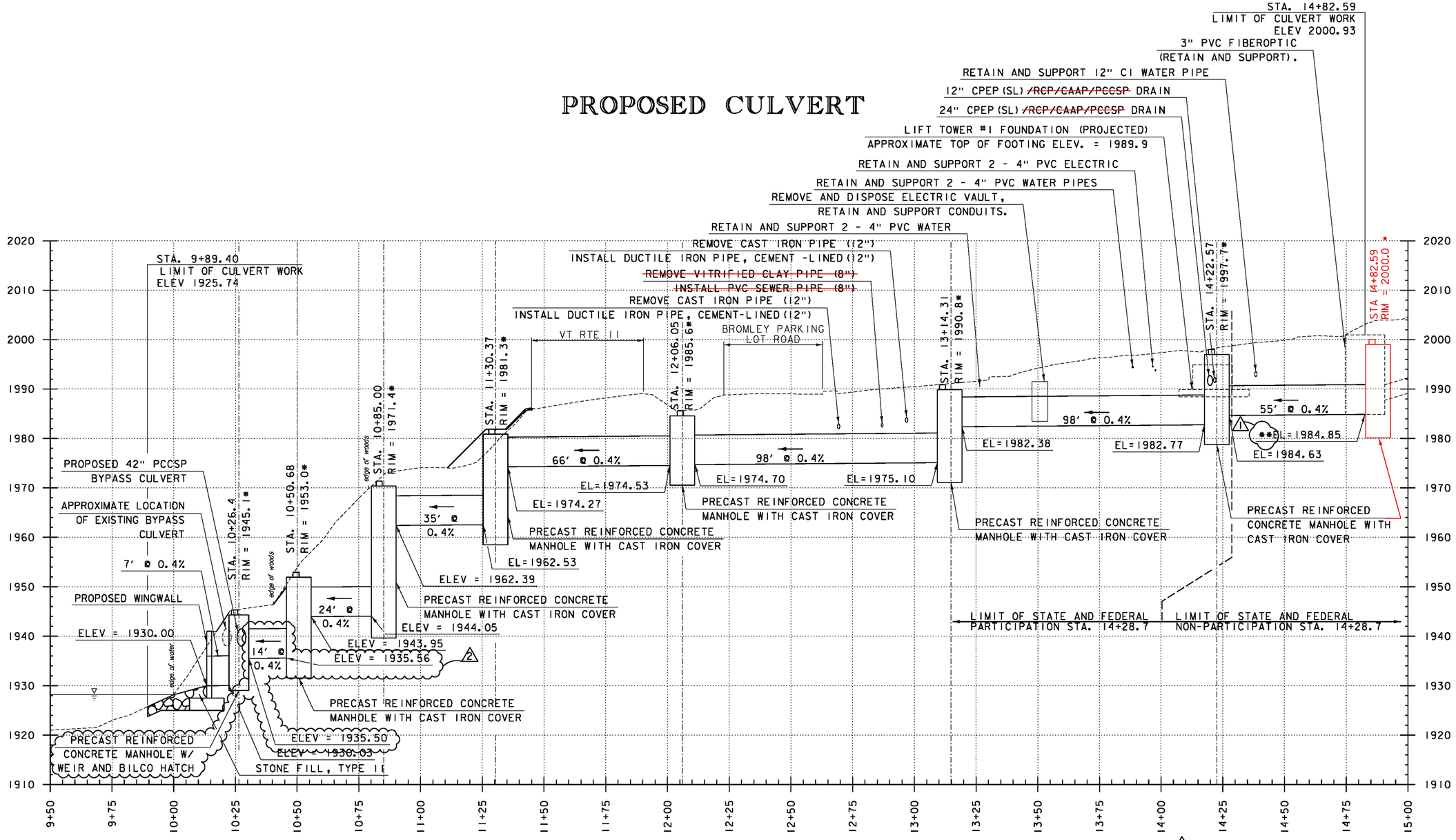
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
PROFILE SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 29 OF 45

PROPOSED CULVERT



⚠1 **PIPE ENTERS STRUCTURE OFF CENTER, PROJECTED ENTRY LOCATION SHOWN

THIS SHEET REPLACES PRECEDING SHEET

REVISION	BY	DATE
⚠1 SECOND ASTERISK WAS ADDED TO NOTE AND ELEVATION CALLOUT	MAB	2/10/2015
⚠2 PROFILE UPDATED TO REFLECT ADDITION OF BAFFLE W/ WEIR.	MAB	6/8/2015

*RIM ELEVATIONS ARE APPROXIMATE AND SHALL BE ADJUSTED TO MEET THE GRADE AS NECESSARY. SEE SHEET 8 FOR ADDITIONAL REQUIREMENTS.

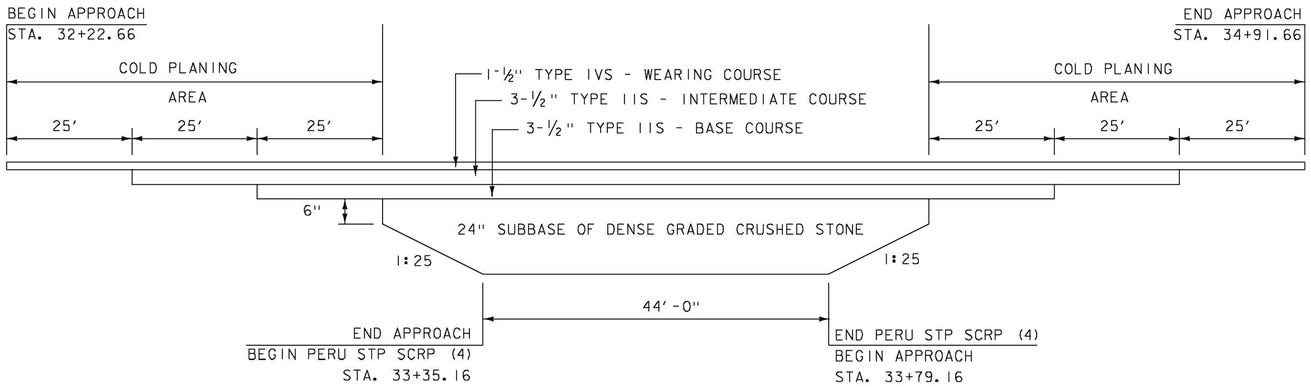
MANHOLE STRUCTURES ARE SHOWN PICTORIALLY FOR INFORMATION ONLY. ACTUAL SHAPE AND SIZE TO BE DETERMINED BY THE CONTRACTOR.

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
PROFILE SHEET 1

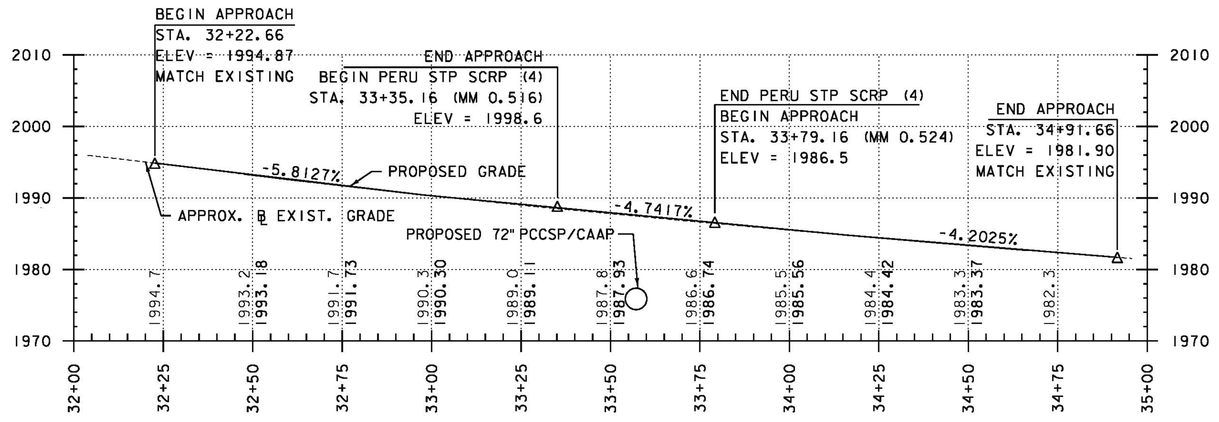
PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 29R OF 45



VT ROUTE 11 MATERIAL TRANSITION DETAIL

NOT TO SCALE

VT ROUTE 11



THE GRADES SHOWN TO THE NEAREST TENTH ARE THE ORIGINAL GROUND APPROXIMATE ELEVATIONS ALONG THE PROPOSED ALIGNMENT. THE GRADES SHOWN TO THE NEAREST HUNDREDTH ARE THE PROPOSED PROFILE GRADES FOR THE NEW ALIGNMENT.

NOTE:
1. ALL STATIONS AND ELEVATIONS ARE SHOWN IN FEET.

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
PROFILE SHEET 2

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 30 OF 45

EPSC PLAN NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE ABANDONMENT OF 382 FT OF CULVERT. 410 FEET OF NEW CULVERT WILL BE INSTALLED ALONG A NEW ALIGNMENT TO TAKE ITS PLACE. THE PROJECT IS LOCATED IN THE TOWN OF PERU, ON VT ROUTE 11, APPROXIMATELY 1800 FT WEST OF THE INTERSECTION OF VT ROUTE 11 AND OLD MANCHESTER RD.

NOTE: AREA OF DISTURBANCE INCLUDES LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA, AS WELL AS WASTE, BORROW AND STAGING AREAS, AND OTHER EARTH DISTURBING ACTIVITIES WITHIN OR DIRECTLY ADJACENT TO THE PROJECT LIMITS AS SHOWN ON THE ATTACHED EPSC PLAN.

TOTAL AREA OF DISTURBANCE AS SHOWN ON THE ATTACHED EPSC PLAN IS APPROXIMATELY 0.48 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

1.2.1 TOPOGRAPHY

THE TOPOGRAPHY OF THE AREA IS A MOUNTAIN THAT IS A MIX OF WELL ESTABLISHED FOREST AND OPEN AREAS. VT ROUTE 11, A PAVED PARKING LOT, AND A PAVED ACCESS ROAD ARE WITHIN THE PROJECT LIMITS. THERE IS A SKI LODGE, SKI LIFT SHACK AND HOTEL IN THE VICINITY, BUT NOT UPSLOPE OF THE HEADWALL. A SMALL HOUSING DEVELOPMENT IS LOCATED UP SLOPE TO THE WEST WITH GRASS AND TREE BUFFERS.

1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

A MOUNTAIN STREAM IS THE ONLY WATER SOURCE WITHIN THE PROJECT LIMITS. THE STREAM BED CONSISTS OF GRAVEL, COBBLES AND BOULDERS. THE TRIBUTARY AREA AT THE HEADWALL IS 120 ACRES. THERE ARE A NUMBER OF DROP INLETS ON SITE DRAINING TO A COMMON MANMADE POND. DUE TO THE NATURE OF THE SURROUNDING TERRAIN THE PROJECT SITE WILL RECEIVE RUNOFF WATER FROM A FEW NEARBY SLOPES.

1.2.3 VEGETATION

THE VEGETATION IN THE PROJECT AREA CONSISTS OF HARDWOOD TREES AND UNDERGROWTH. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS DIRECTLY AFFECTED BY THE CONSTRUCTION OF THE NEW CULVERT. UPON PROJECT COMPLETION, THE HEADWALL WILL BE PROTECTED WITH STONE FILL, TYPE II AS SHOWN ON THE PLANS. DISTURBED VEGETATION WILL BE REESTABLISHED PER THE LANDSCAPING PLAN AS WELL AS WITH STANDARD SEED AND MULCH PRACTICES.

1.2.4 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF BENNINGTON, VERMONT. SOILS ON THE PROJECT SITE ARE RAWSONVILLE / MUNDAL - HILLY, ROCKY, "K FACTOR" = 0.64 AND RAWSONVILLE / HOGBACK - VERY HILLY, VERY ROCKY, "K FACTOR" = 0.64. THE SOIL IS CONSIDERED HIGHLY ERODIBLE DUE TO SIGNIFICANT SLOPES.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING:
0.0-0.23 = LOW EROSION POTENTIAL
0.24-0.36 = MODERATE EROSION POTENTIAL
0.37 AND HIGHER = HIGH EROSION POTENTIAL

1.2.5 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO
HISTORICAL OR ARCHEOLOGICAL AREAS: NO
PRIME AGRICULTURAL LAND: NO
THREATENED AND ENDANGERED SPECIES: NO
WATER RESOURCE: UNNAMED BROOK
WETLANDS: NO

1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF GENERAL PERMIT 3-9020 FOR STORMWATER RUNOFF FROM CONSTRUCTION SITES. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THE CONTRACTOR WILL BE RESPONSIBLE FOR ANY ADDITIONAL PERMITTING.

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT. THE PRINCIPLES OUTLINED IN THIS NARRATIVE CONSIST OF APPLYING MEASURES THROUGHOUT CONSTRUCTION OF THE PROJECT IN ORDER TO MINIMIZE SEDIMENT TRANSPORT TO THE RECEIVING WATERS. THE MEASURES INCLUDE STABILIZATION AND STRUCTURAL PRACTICES, STORM WATER CONTROLS AND OTHER POLLUTION PREVENTION PRACTICES. THEY HAVE BEEN PROPOSED BY THE DESIGNER AS A BASIS FOR PROTECTING RESOURCES AND WILL NEED TO BE BUILT UPON BASED ON THE SPECIFIC MEANS AND METHODS OF THE CONTRACTOR. REFER TO THE LOW RISK SITE HANDBOOK AND APPROPRIATE DETAIL SHEETS FOR SPECIFIC GUIDANCE AND CONSTRUCTION DETAILING.

ALL MEASURES SHALL BE REGULARLY MAINTAINED AND SHALL BE CHECKED FOR SEDIMENT BUILD-UP. SEDIMENT SHALL BE DISPOSED OF AT AN APPROVED SITE WHERE IT WILL NOT BE SUBJECT TO EROSION.

1.4.1 MARK SITE BOUNDARIES

SITE BOUNDARIES AND AREAS CONSTRUCTION EQUIPMENT CAN ACCESS SHALL BE DELINEATED.

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO PHYSICALLY MARK SITE BOUNDARIES. BARRIER FENCE SHALL BE USED INSTEAD OF PROJECT DEMARCATION FENCE WITHIN 100 FEET OF A WATER RESOURCE (STREAM, BROOK, LAKE, POND, WETLAND, ETC).

1.4.2 LIMIT DISTURBANCE AREA

PREVENTING INITIAL SOIL EROSION BY MINIMIZING THE EXPOSED AREA IS MUCH MORE EFFECTIVE THAN TREATING ERODED SEDIMENT. EARTH DISTURBANCE CAN BE MINIMIZED THROUGH CONSTRUCTION PHASING BY ONLY OPENING UP EARTH AS NECESSARY. THIS CAN LIMIT THE AREA THAT WILL BE DISTURBED AND EXPOSED TO EROSION. EMPLOY TEMPORARY CONSTRUCTION STABILIZATION PRACTICES IN INCREMENTAL STAGES AS PHASES CHANGE. FOR PROJECTS WHICH FALL UNDER THE CONSTRUCTION GENERAL PERMIT, ONLY THE ACREAGE LISTED ON THE PERMIT AUTHORIZATION MAY BE EXPOSED AT ANY GIVEN TIME.

MAINTAINING VEGETATED BUFFERS ALONG STREAM BANKS, WETLANDS OR OTHER SENSITIVE AREAS IS A CRUCIAL EROSION AND SEDIMENT CONTROL MEASURE THAT SHOULD BE ESTABLISHED WHEREVER POSSIBLE.

1.4.3 SITE ENTRANCE/EXIT STABILIZATION

TRACKING OF SEDIMENT ONTO PUBLIC HIGHWAYS SHALL BE MINIMIZED TO REDUCE THE POTENTIAL FOR RUNOFF ENTERING RECEIVING WATERS. INSTALLATION SHALL COINCIDE WITH THE CONTRACTOR'S PROGRESS SCHEDULE.

STABILIZED CONSTRUCTION ENTRANCES SHALL BE INSTALLED AS PROPOSED ON THE EPSC PLAN AND ANYWHERE EQUIPMENT WILL BE GOING FROM AREAS OF EXPOSED SOILS TO PAVED SURFACES.

1.4.4 INSTALL SEDIMENT BARRIERS

SEDIMENT BARRIERS SHALL BE UTILIZED TO INTERCEPT RUNOFF AND ALLOW SUSPENDED SEDIMENT TO SETTLE OUT. THEY SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

TURBIDITY CURTAIN SHALL BE INSTALLED AT THE DOWNSTREAM END OF CONSTRUCTION AS SHOWN ON THE PLANS.

1.4.5 SLOW DOWN CHANNELIZED RUNOFF

CHECK STRUCTURES SHALL BE UTILIZED TO REDUCE THE VELOCITY, AND THUS THE EROSIVE POTENTIAL, OF CONCENTRATED FLOW IN CHANNELS.

THIS MEASURE IS NOT ANTICIPATED ON THIS PROJECT.

1.4.6 CONSTRUCT PERMANENT CONTROLS

PERMANENT STORMWATER TREATMENT DEVICES SHALL BE INSTALLED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH PERMIT CONDITIONS.

THIS MEASURE IS NOT ANTICIPATED ON THIS PROJECT.

1.4.7 STABILIZE EXPOSED SOILS DURING CONSTRUCTION

ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY STABILIZATION IN PLACE WITHIN 48 HOURS OF DISTURBANCE OR IN ACCORDANCE WITH THE CONSTRUCTION GENERAL PERMIT 3-9020 AUTHORIZATION.

BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED TO STABILIZE ALL SLOPES STEEPER THAN 1:3.

THE FORECAST OF RAINFALL EVENTS SHALL TRIGGER IMMEDIATE PROTECTION OF EXPOSED SOILS.

1.4.8 WINTER STABILIZATION

VARIOUS MEASURES SPECIFIC TO WINTER MAY BE NECESSARY SHOULD THE PROJECT EXTEND INTO WINTER (OCTOBER 15 THROUGH APRIL 15). REFER TO THE LOW RISK SITE HANDBOOK FOR GUIDANCE.

THIS MEASURE IS NOT ANTICIPATED ON THIS PROJECT, WORK WITHIN THE EXISTING CULVERTS AND STREAM SHALL BE COMPLETED DURING THE LOW FLOW SEASON (JULY 15TH TO OCTOBER 1ST).

1.4.9 STABILIZE SOIL AT FINAL GRADE

EXPOSED SOIL MUST BE STABILIZED WITHIN 48 HOURS OF REACHING FINAL GRADE.

SEED, MULCH, FERTILIZER AND LIME SHALL BE USED TO ESTABLISH PERMANENT VEGETATION. FOR SLOPES STEEPER THAN 1:3, BIODEGRADABLE EROSION CONTROL MATTING OR AN EQUIVALENT SHALL BE USED INSTEAD OF MULCH.

1.4.10 DE-WATERING ACTIVITIES

DISCHARGE FROM DEWATERING ACTIVITIES THAT FLOWS OFF OF THE CONSTRUCTION SITE MUST NOT CAUSE OR CONTRIBUTE TO A VIOLATION OF THE VERMONT WATER QUALITY STANDARDS.

TREATMENT OF DEWATERING COFFERDAM IS NOT ANTICIPATED, THE EXISTING CULVERT SHALL REMAIN IN USE UNTIL THE NEW CULVERT IS COMPLETED.

1.4.11 INSPECT YOUR SITE

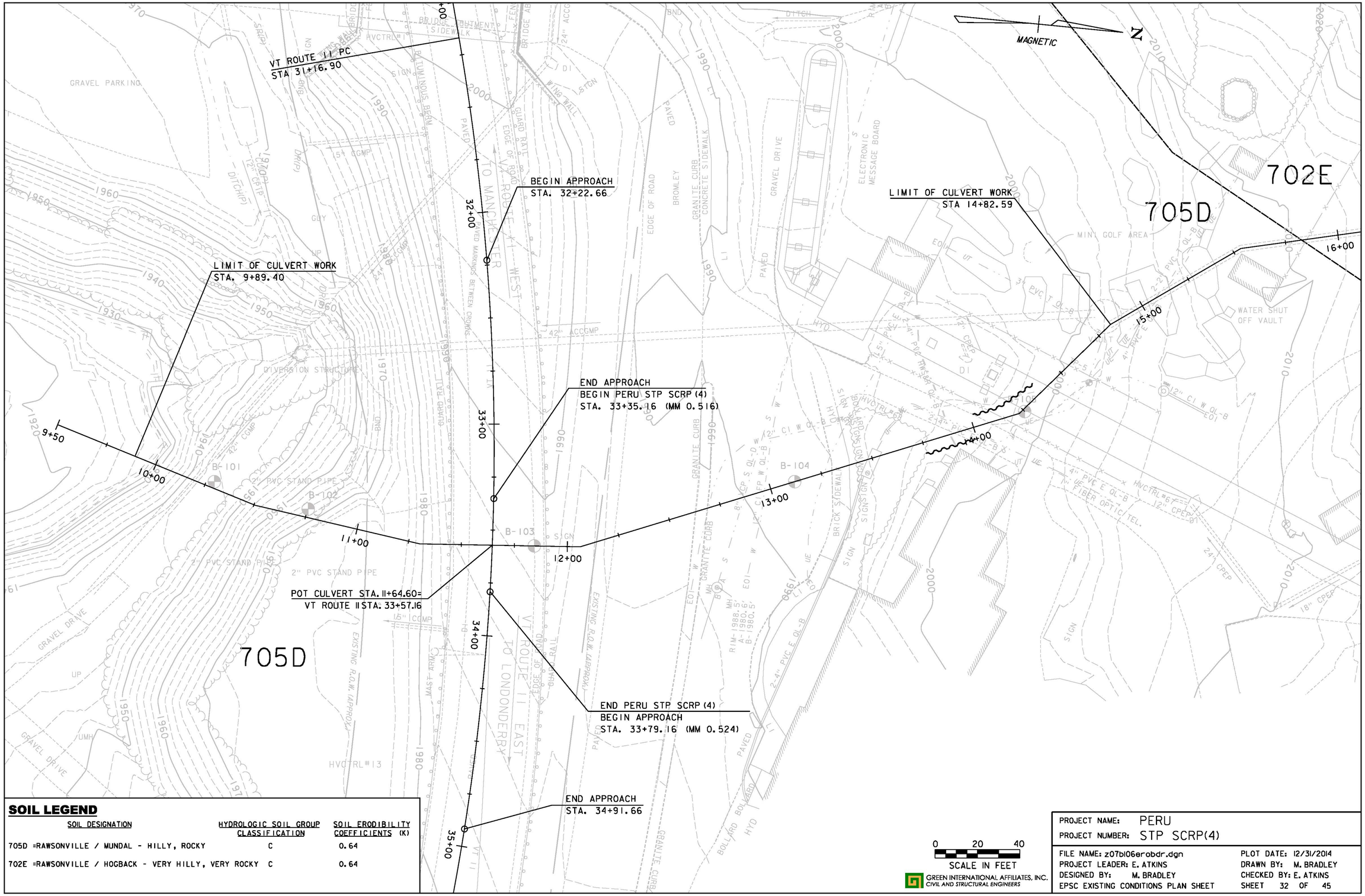
INSPECT THE PROJECT SITE BASED ON SPECIAL PROVISION REQUIREMENTS OR CONSTRUCTION GENERAL PERMIT AUTHORIZATION STIPULATIONS.

1.5 SEQUENCE AND STAGING

THIS SECTION WILL BE DEVELOPED BY THE CONTRACTOR USING THE GUIDANCE OUTLINED IN THE VTRANS EPSC PLAN CONTRACTOR CHECKLIST.

1.5.1 OFF-SITE ACTIVITIES

IN ADDITION TO THE CONTRACTOR CHECKLIST ANY ACTIVITIES OUTSIDE THE CONSTRUCTION LIMITS SHALL FOLLOW SUBSECTIONS 105.25- 105.29 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.



SOIL LEGEND

SOIL DESIGNATION	HYDROLOGIC SOIL GROUP CLASSIFICATION	SOIL ERODIBILITY COEFFICIENTS (K)
705D =RAWSONVILLE / MUNDAL - HILLY, ROCKY	C	0.64
702E =RAWSONVILLE / HOGBACK - VERY HILLY, VERY ROCKY	C	0.64

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106erobdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
EPSC EXISTING CONDITIONS PLAN SHEET

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 32 OF 45

NOTES:

1. SEE EPSC DETAIL SHEETS FOR CONSTRUCTION DETAILS.

2. ALL AREAS OF DISTURBANCE MUST HAVE TEMPORARY OR FINAL STABILIZATION WITHIN 7 DAYS OF THE INITIAL DISTURBANCE. AFTER THIS TIME, ANY DISTURBANCE IN THE AREA MUST BE STABILIZED AT THE END OF EACH WORK DAY. THE FOLLOWING EXCEPTIONS APPLY:
   I) STABILIZATION IS NOT REQUIRED IF WORK IS TO CONTINUE IN THE AREA WITHIN THE NEXT 24 HOURS AND THERE IS NO PRECIPITATION FORECAST FOR THE NEXT 24 HOURS.
   II) STABILIZATION IS NOT REQUIRED IF THE WORK IS OCCURRING IN A SELF CONTAINED EXCAVATION WITH A DEPTH OF 2 FEET OR GREATER.

3. THE CONTRACTOR SHALL MINIMIZE ANY SOIL DISTURBANCES BETWEEN OCTOBER 15 THROUGH APRIL 15. TO ASSURE A VIGOROUS CATCH OF VEGETATIVE COVER, SEEDING AND MULCHING SHALL BE COMPLETED BY SEPTEMBER 15 TO THE EXTENT POSSIBLE, OR AS DIRECTED BY THE ENGINEER.

IMPACT BELOW EXISTING ORDINARY HIGH WATER LINE
APPROXIMATE AREA OF IMPACT = 1,898 SF+/- (0.044 AC)

STONE FILL, TYPE I
32+94.7 RT - 33+51.6 RT

GEOTEXTILE FOR FILTER CURTAIN
9+96.5 LT - 9+96.5 RT

SEED
RURAL AREA MIX:
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
12+24.6 LT - 12+53.6 LT

URBAN AREA MIX:
14+01.4 LT-RT - 14+82.6 LT-RT

SEED, WINTER RYE
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
14+01.4 LT-RT - 14+82.6 LT-RT

FERTILIZER
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
12+24.6 LT - 12+53.6 LT
14+01.4 LT-RT - 14+82.6 LT-RT

AGRICULTURAL LIMESTONE
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
12+24.6 LT - 12+53.6 LT
14+01.4 LT-RT - 14+82.6 LT-RT

VEHICLE TRACKING PAD
10+25 RT
33+75 RT

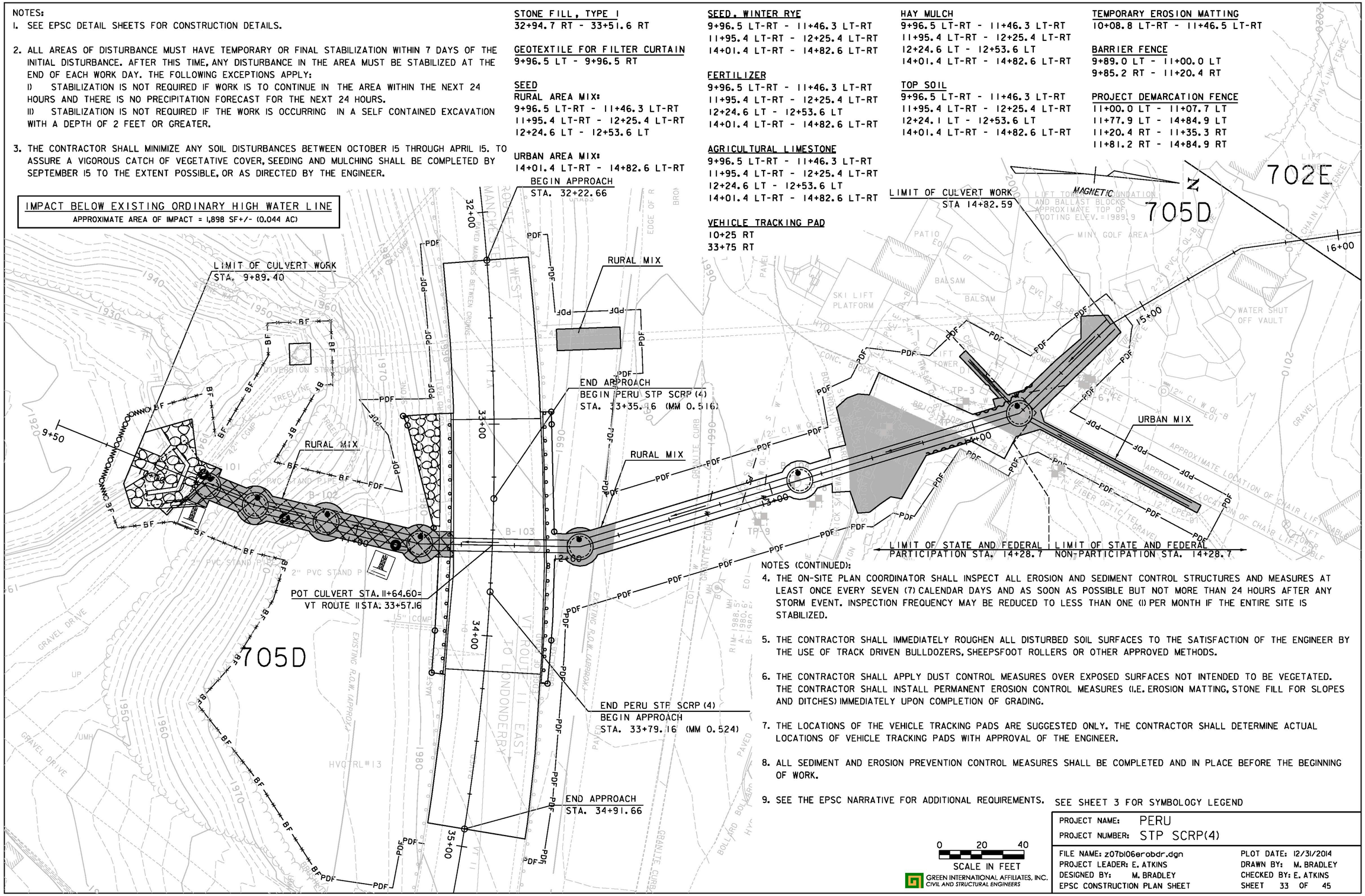
HAY MULCH
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
12+24.6 LT - 12+53.6 LT
14+01.4 LT-RT - 14+82.6 LT-RT

TOP SOIL
9+96.5 LT-RT - 11+46.3 LT-RT
11+95.4 LT-RT - 12+25.4 LT-RT
12+24.1 LT - 12+53.6 LT
14+01.4 LT-RT - 14+82.6 LT-RT

TEMPORARY EROSION MATTING
10+08.8 LT-RT - 11+46.5 LT-RT

BARRIER FENCE
9+89.0 LT - 11+00.0 LT
9+85.2 RT - 11+20.4 RT

PROJECT DEMARCATION FENCE
11+00.0 LT - 11+07.7 LT
11+77.9 LT - 14+84.9 LT
11+20.4 RT - 11+35.3 RT
11+81.2 RT - 14+84.9 RT



NOTES (CONTINUED):

4. THE ON-SITE PLAN COORDINATOR SHALL INSPECT ALL EROSION AND SEDIMENT CONTROL STRUCTURES AND MEASURES AT LEAST ONCE EVERY SEVEN (7) CALENDAR DAYS AND AS SOON AS POSSIBLE BUT NOT MORE THAN 24 HOURS AFTER ANY STORM EVENT. INSPECTION FREQUENCY MAY BE REDUCED TO LESS THAN ONE (1) PER MONTH IF THE ENTIRE SITE IS STABILIZED.

5. THE CONTRACTOR SHALL IMMEDIATELY ROUGHEN ALL DISTURBED SOIL SURFACES TO THE SATISFACTION OF THE ENGINEER BY THE USE OF TRACK DRIVEN BULLDOZERS, SHEEPSFOOT ROLLERS OR OTHER APPROVED METHODS.

6. THE CONTRACTOR SHALL APPLY DUST CONTROL MEASURES OVER EXPOSED SURFACES NOT INTENDED TO BE VEGETATED. THE CONTRACTOR SHALL INSTALL PERMANENT EROSION CONTROL MEASURES (I.E. EROSION MATTING, STONE FILL FOR SLOPES AND DITCHES) IMMEDIATELY UPON COMPLETION OF GRADING.

7. THE LOCATIONS OF THE VEHICLE TRACKING PADS ARE SUGGESTED ONLY. THE CONTRACTOR SHALL DETERMINE ACTUAL LOCATIONS OF VEHICLE TRACKING PADS WITH APPROVAL OF THE ENGINEER.

8. ALL SEDIMENT AND EROSION PREVENTION CONTROL MEASURES SHALL BE COMPLETED AND IN PLACE BEFORE THE BEGINNING OF WORK.

9. SEE THE EPSC NARRATIVE FOR ADDITIONAL REQUIREMENTS.

SEE SHEET 3 FOR SYMBOLOGY LEGEND

0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106erobdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
EPSC CONSTRUCTION PLAN SHEET	SHEET 33 OF 45

VT ROUTE 11 PC
STA 31+16.90

BEGIN APPROACH
STA. 32+22.66

LIMIT OF CULVERT WORK
STA. 9+89.40

LIMIT OF CULVERT WORK
STA 14+82.59

END APPROACH
BEGIN PERU STP SCRP(4)
STA. 33+35.16 (MM 0.516)

END PERU STP SCRP(4)
BEGIN APPROACH
STA. 33+79.16 (MM 0.524)

END APPROACH
STA. 34+91.66

POT CULVERT STA. 11+64.60=
VT ROUTE 11 STA. 33+57.16

705D

702E

705D

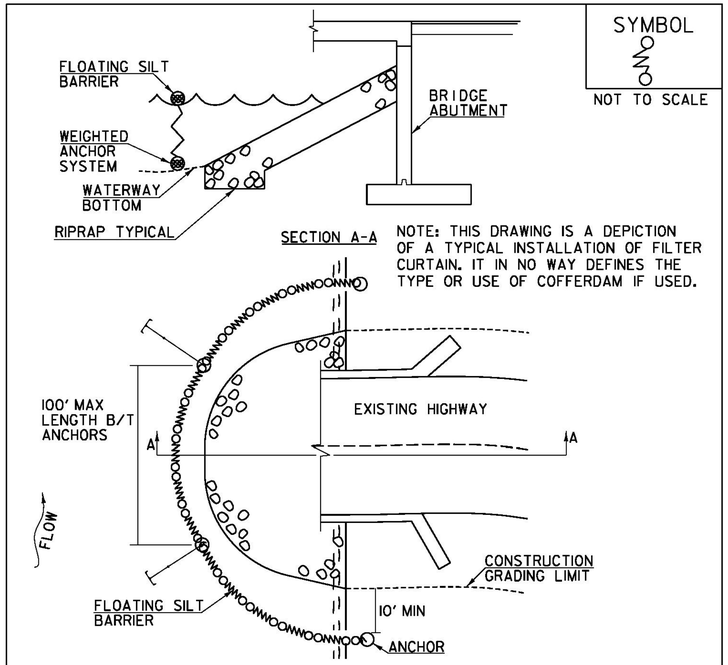
MAGNETIC N

SEE SHEET 3 FOR SYMBOLOGY LEGEND

SCALE IN FEET 0 20 40

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07bl06erobdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
EPSC FINAL CONDITIONS PLAN SHEET	SHEET 34 OF 45



CONSTRUCTION SPECIFICATIONS

1. FILTER CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY, OR IN A WATERWAY WITH STREAM VELOCITIES GREATER THAN 1.5 FEET/SECOND.
2. MAXIMUM 100' LENGTH BETWEEN ANCHORS.
3. LAST SECTION SHALL TERMINATE A MINIMUM OF 10' BEYOND LIMIT OF DISTURBANCE.
4. THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE WHICH ALLOWS THE CURTAIN TO CONFORM TO THE BOTTOM OF THE WATERWAY.
5. THE CURTAIN SHALL BE REMOVED BY SLOWLY PULLING TOWARD THE SHORE MINIMIZING THE ESCAPE OF SEDIMENTS INTO WATERWAY.

FILTER CURTAIN

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 649 FOR GEOTEXTILE FOR FILTER CURTAIN (PAY ITEM 649.61).

REVISIONS	
APRIL 1, 2008	WHF
JANUARY 13, 2009	WHF
SEPTEMBER 4, 2009	WHF

VAOT RURAL AREA MIX

	LBS/AC				
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
37.5%	22.5	45	CREEPING RED FESCUE	85%	98%
37.5%	22.5	45	TALL FESCUE	90%	95%
5.0%	3	6	RED TOP	90%	95%
15.0%	9	18	BIRDSFOOT TREFOIL	85%	98%
5.0%	3	6	ANNUAL RYE GRASS	85%	95%
100%	60	120			

VAOT URBAN AREA MIX

	LBS/AC				
% WEIGHT	BROADCAST	HYDROSEED	NAME	GERM %	PURITY %
42.5%	34	68	CREEPING RED FESCUE	85%	98%
10.0%	8	16	PERENNIAL RYE GRASS	90%	95%
42.5%	34	68	KENTUCKY BLUE GRASS	85%	85%
5.0%	4	8	ANNUAL RYE GRASS	85%	95%
100%	80	160			

SOIL AMENDMENT GUIDANCE

FERTILIZER		LIME	
BROADCAST	HYDROSEED	BROADCAST	HYDROSEED
10-20-10	*FOLLOW*	PELLETIZED	*FOLLOW*
500 LBS/AC	*MANUFACTURER*	2 TONS/AC	*MANUFACTURER*

CONSTRUCTION GUIDANCE

1. RURAL SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED UPLAND (NON WETLAND) AREAS DISTURBED BY THE CONTRACTOR.
2. URBAN SEED MIX: USE AS INDICATED IN THE PLANS AND/OR FOR ALL ESTABLISHED LAWN AREAS DISTURBED BY THE CONTRACTOR.
3. ALL SEED MIXTURES: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.
4. FERTILIZER AND LIMESTONE: SHALL FOLLOW RATES SHOWN ON PLAN OR AS DIRECTED BY THE ENGINEER
5. HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, ACHIEVE 90% GROUND COVER OR AS DIRECTED BY THE ENGINEER.
6. TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.
7. HYDROSEEDING: ALTHOUGH GUIDANCE IS GIVEN ABOVE THE SITE CONDITIONS AND THE TYPE OF HYDROSEED WILL ULTIMATELY DICTATE THE AMOUNTS AND TYPES OF SOIL AMENDMENTS TO BE APPLIED
8. TURF ESTABLISHMENT: PLACING SEED, FERTILIZER, LIME AND MULCH PRIOR TO SEPTEMBER 15 AND AFTER APRIL 15 CAN BETTER ENSURE A VIGOROUS GROWTH OF GRASS.

ADAPTED FROM VTRANS TECHNICAL LANDSCAPE MANUAL FOR ROADWAYS AND TRANSPORTATION FACILITIES

TURF ESTABLISHMENT

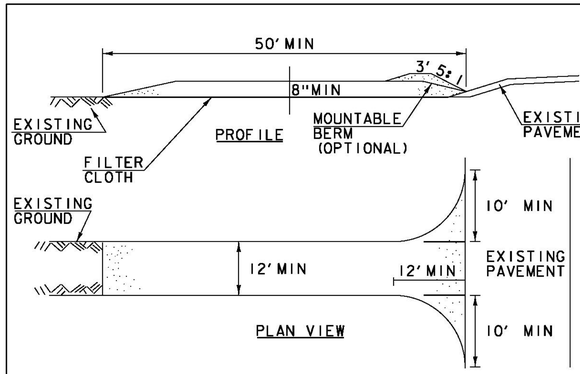
REVISIONS	
JUNE 23, 2009	WHF
JANUARY 15, 2010	WHF
FEBRUARY 16, 2011	WHF

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106erodet.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
EPSC DETAIL SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: T. BIGELOW
CHECKED BY: E. ATKINS
SHEET 35 OF 45

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. STONE SIZE- USE 1-4" STONE, RECLAIMED OR RECYCLED CONCRETE EQUIVALENT.
2. LENGTH- NOT LESS THAN 50' (EXCEPT ON A SINGLE RESIDENCE LOT WHERE A 30' MINIMUM LENGTH APPLIES).
3. THICKNESS- NOT LESS THAN 8".
4. WIDTH- 12' MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS. 24' IF SINGLE ENTRANCE TO SITE.
5. GEOTEXTILE MUST BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING STONE.
6. SURFACE WATER- ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED BENEATH THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY, ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AND NEEDED MAINTENANCE SHALL BE PROVIDED ACCORDING TO PERMIT REQUIREMENTS.

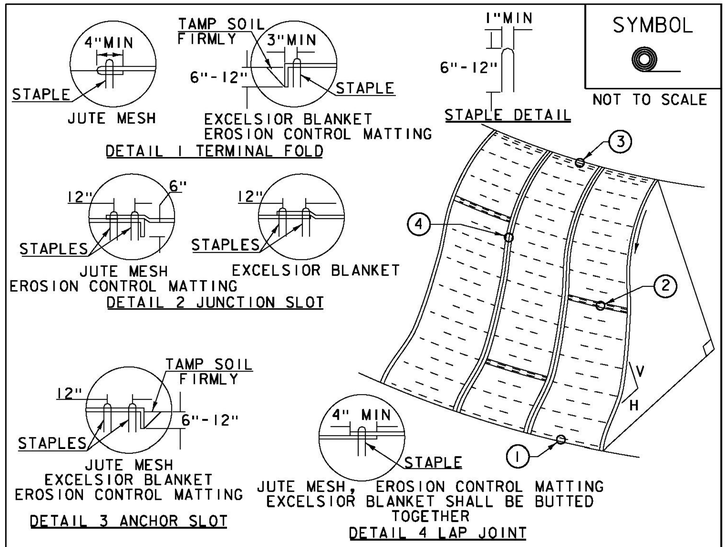
ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

STABILIZED CONSTRUCTION ENTRANCE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 FOR VEHICLE TRACKING PAD (PAY ITEM 653.35) OR AS SPECIFIED IN THE CONTRACT.

REVISIONS	
MARCH 24, 2008	WHF
JANUARY 13, 2009	WHF



SYMBOL

NOT TO SCALE

CONSTRUCTION SPECIFICATIONS

1. APPLY TO SLOPES GREATER THAN 3H:1V OR WHERE NECESSARY TO AID IN ESTABLISHING VEGETATION.
2. APPLY FERTILIZER, LIME SEED PRIOR TO PLACING MATTING.
3. STAPLES ARE TO BE PLACED ALTERNATELY, IN COLUMNS APPROXIMATELY 2' APART AND IN ROWS APPROXIMATELY 3' APART. APPROXIMATELY 175 STAPLES ARE REQUIRED PER 4'X225' ROLL OF MATERIAL AND 125 STAPLES ARE REQUIRED PER 4'X150' ROLL OF MATERIAL.
4. DISTURBED AREAS SHALL BE SMOOTHLY GRADED. EROSION CONTROL MATERIAL SHALL BE PLACED LOOSELY OVER GROUND SURFACE. DO NOT STRETCH.
5. ALL TERMINAL ENDS AND TRANSVERSE LAPS SHALL BE STAPLED AT APPROXIMATELY 12" INTERVALS.

ADAPTED FROM DETAILS PROVIDED BY: NEW YORK STATE DEC ORIGINALLY DEVELOPED BY USDA-NRCS VERMONT DEPARTMENT OF ENVIRONMENTAL CONSERVATION

ROLLED EROSION CONTROL PRODUCT (RECP) SIDE SLOPE

NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.
THIS WORK SHALL BE PERFORMED IN ACCORDANCE WITH SECTION 653 AND AS SHOWN IN THE PLANS FOR TEMPORARY EROSION MATTING (PAY ITEM 653.20) ~~OR PERMANENT EROSION MATTING (PAY ITEM 653.21).~~

REVISIONS	
APRIL 16, 2007	JMF
JANUARY 13, 2009	WHF

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106erodet.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: T. BIGELOW
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
EPSC DETAIL SHEET 2	SHEET 36 OF 45

LEGEND

[ ] = EXISTING SIGN
R&S = REMOVE AND SALVAGE
RET = RETAIN EXISTING SIGN OR POST
EL = 4" WHITE EDGE LINE
DYCL = 4" DOUBLE YELLOW CENTERLINE
CL = 4" YELLOW CENTERLINE
GORE = GORING

DURABLE 4 INCH WHITE LINE, THERMOPLASTIC
32+22.7 - 34+91.7 LT, 274 LF (EL)
32+22.7 - 34+91.7 RT, 267 LF (EL)
13+14.6 - 13+31.6 LT-RT, 126 LF (RESTORE SIX 9' X 18' PARKING STALLS)

DURABLE 4 INCH YELLOW LINE, THERMOPLASTIC
32+22.7 - 34+91.7 LT, 272 LF (DYCL)
32+22.7 - 34+91.7 LT, 260 LF (DYCL)
12+31.8 - 12+41.3 LT-RT, 20 LF (CL)

DURABLE 6 INCH YELLOW LINE, THERMOPLASTIC
32+47.7 - 34+91.7 LT-RT, 288 LF, (GORE)

REMOVAL OF EXISTING PAVEMENT MARKINGS
13+14.6 - 13+31.6

REMOVING SIGNS
7 EACH

ERECTING SALVAGED SIGNS
7 EACH

NOTES:
1. FOR ADDITIONAL TEMPORARY PAVEMENT MARKINGS AND PAVEMENT MARKING MASK, SEE TRAFFIC CONTROL PLAN SHEETS

2. THE CONTRACTOR SHALL RESTORE ALL DISTURBED PAVEMENT MARKINGS TO THEIR PRECONSTRUCTION CONDITION OR AS DIRECTED BY THE ENGINEER

MAGNETIC N

BEGIN APPROACH
STA. 32+22.66

MATCH TO EXISTING MARKINGS

LIMIT OF CULVERT WORK
STA. 14+82.59

LIMIT OF CULVERT WORK
STA. 9+89.40

END APPROACH
BEGIN PERU STP SCRP(4)
STA. 33+35.16 (MM 0.516)

LIMIT OF WORK (TYP)

VARIES

POT CULVERT STA. 11+64.60=
VT ROUTE 11 STA. 33+57.16

END PERU STP SCRP(4)
BEGIN APPROACH
STA. 33+79.16 (MM 0.524)

MATCH TO EXISTING MARKINGS

END APPROACH
STA. 34+91.66

ALL 6 SIGNS REMOVED
- BUT ONLY 4 RESET
AS PER BROMLEY

TEMPORARY 4 INCH WHITE LINE, PAINT
32+22.7 - 34+91.7 LT, 274 LF (EL)
32+22.7 - 34+91.7 RT, 267 LF (EL)
13+14.6 - 13+31.6 LT-RT, 126 LF (RESTORE SIX 9' X 18' PARKING STALLS)

TEMPORARY 4 INCH YELLOW LINE, PAINT
32+22.7 - 34+91.7 LT, 272 LF (DYCL) NOT USED
32+22.7 - 34+91.7 LT, 260 LF (DYCL)
12+31.8 - 12+41.3 LT-RT, 20 LF (CL)

TEMPORARY 6 INCH YELLOW LINE, PAINT
32+47.7 - 34+91.7 LT-RT, 288 LF, (GORE)

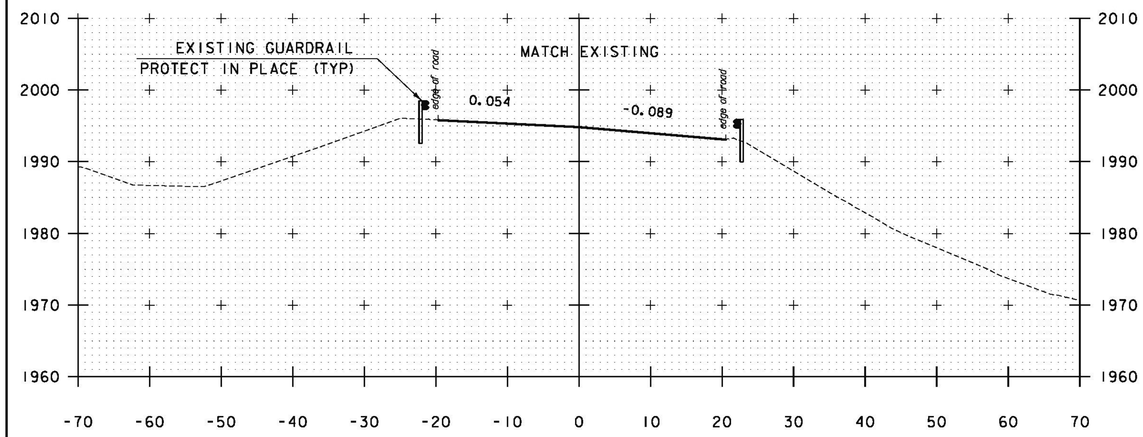
0 20 40
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

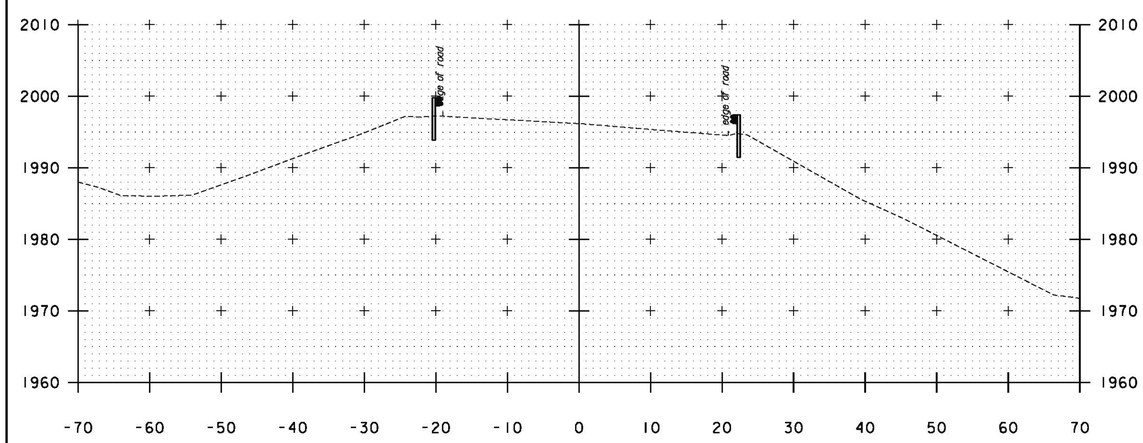
PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106pmbdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
TRAFFIC SIGNS AND MARKINGS SHEET

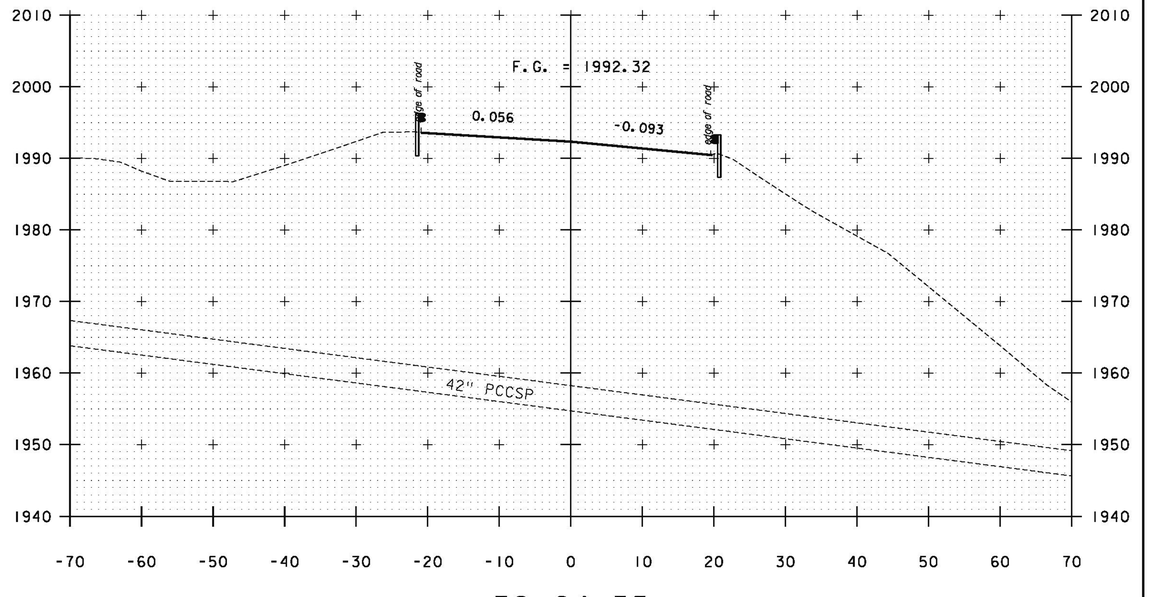
PLOT DATE: 12/31/2014
DRAWN BY: S. SOLLA
CHECKED BY: E. ATKINS
SHEET 37 OF 45



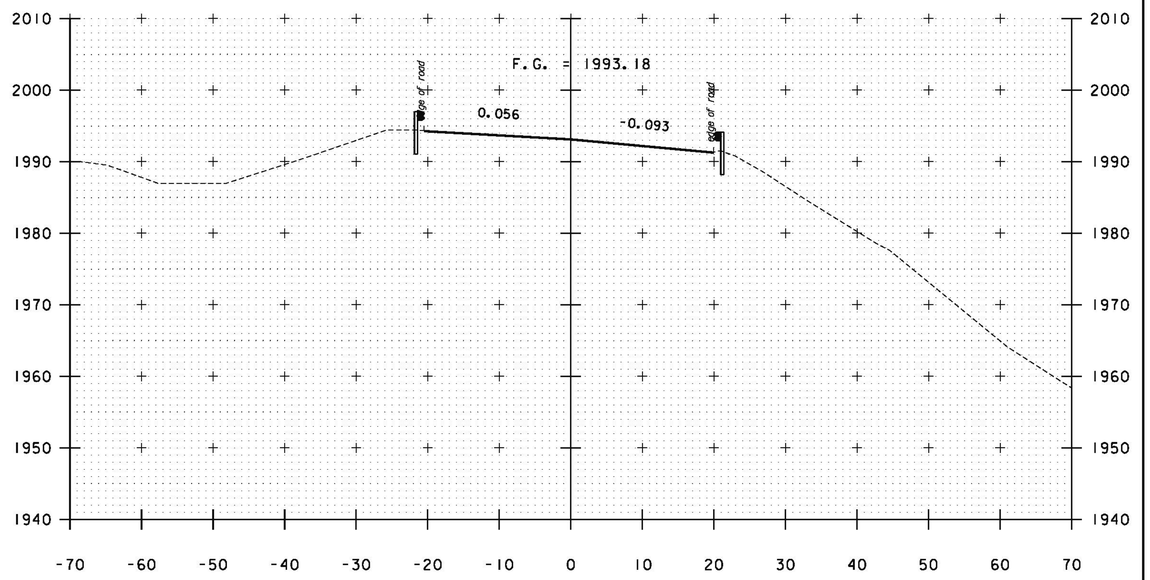
32+22.66 BEGIN APPROACH



32+00



32+64.55



32+50

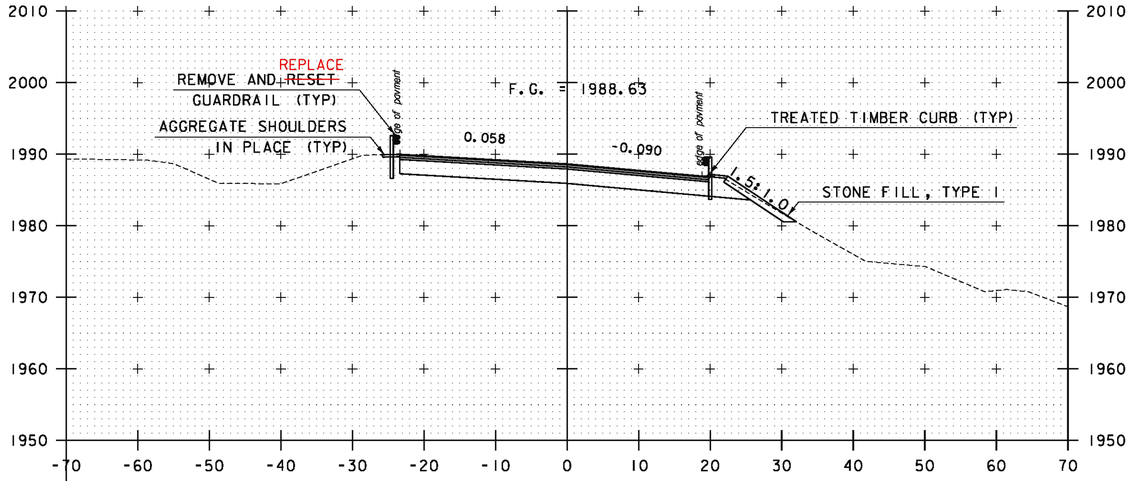
STA. 32+00 TO STA. 32+64.55

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

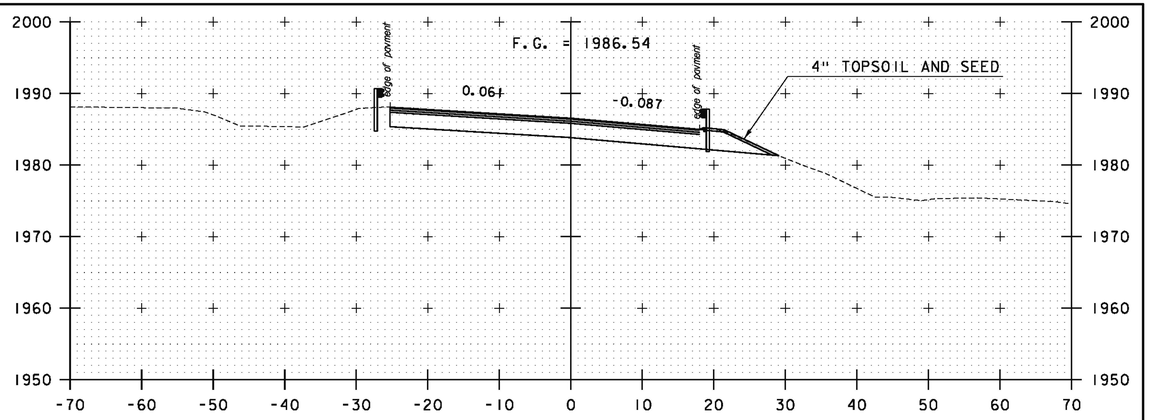
FILE NAME: z07bl06xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
CROSS SECTION SHEET 1

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 38 OF 45

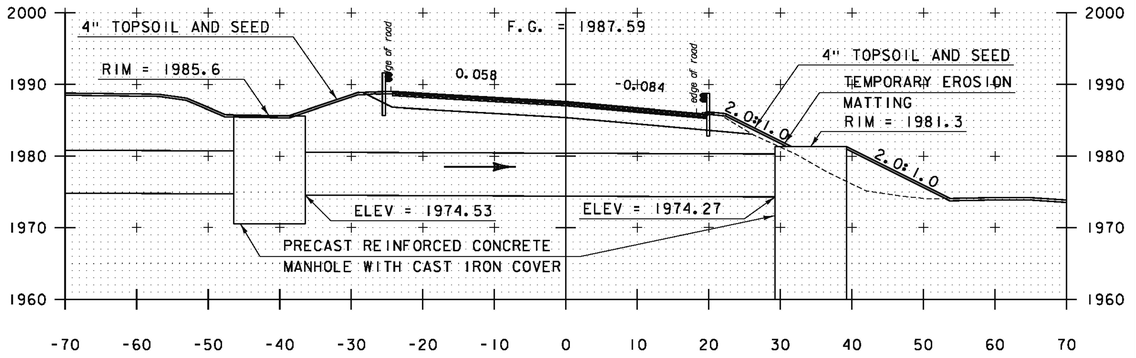
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS



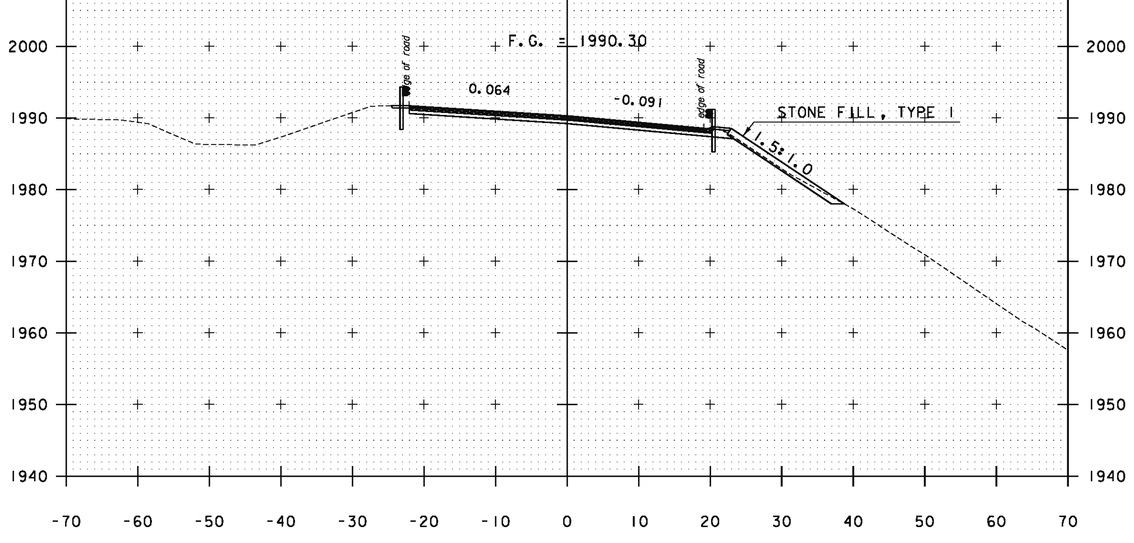
33+35.16 END APPROACH
BEGIN PERU STP SCRP(4)



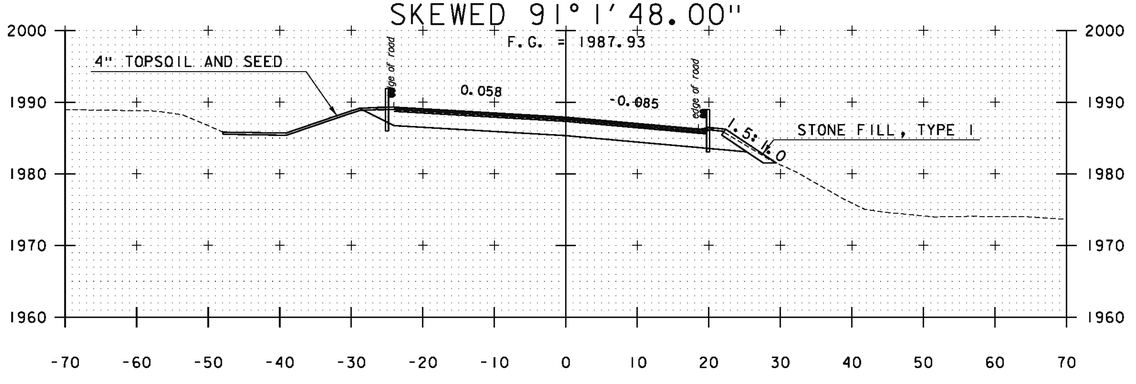
33+79.16 END PERU STP SCRP(4)
BEGIN APPROACH



33+57 SPECIAL PROVISION (72" PCCSP/CAAP)
SKEWED 91° 1' 48.00"



33+00



33+50

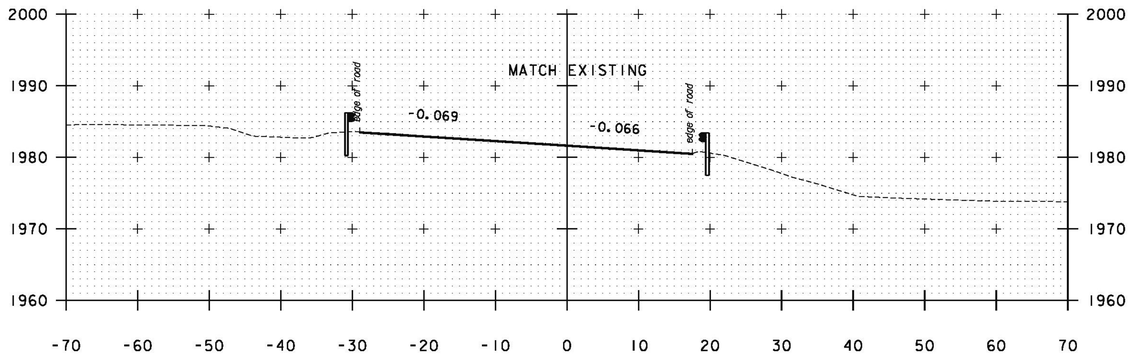
STA. 33+00 TO STA. 33+79.16

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

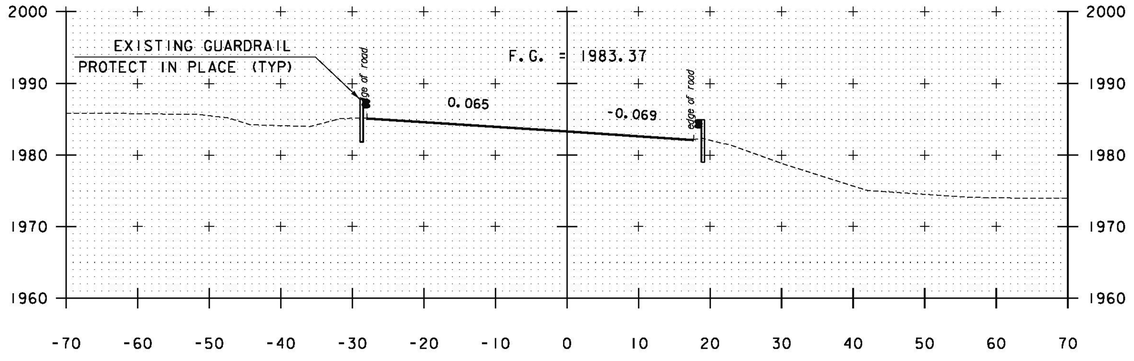
FILE NAME: z07b106xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
CROSS SECTION SHEET 2

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 39 OF 45

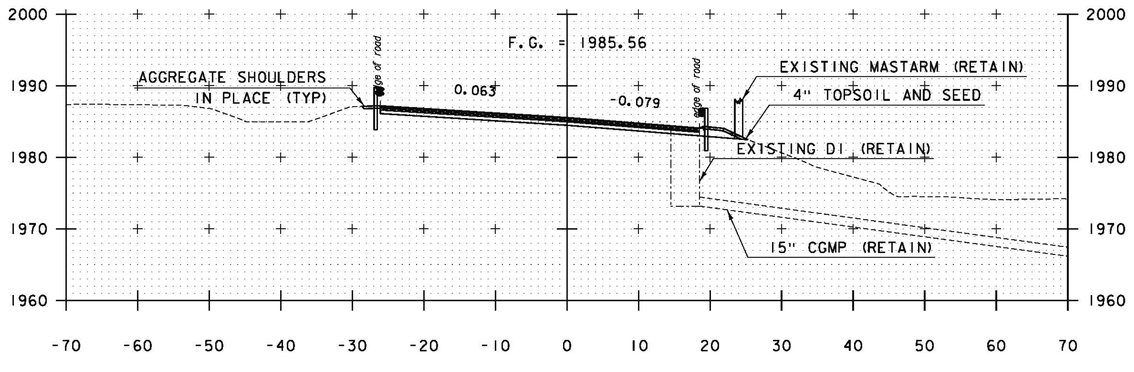
GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS



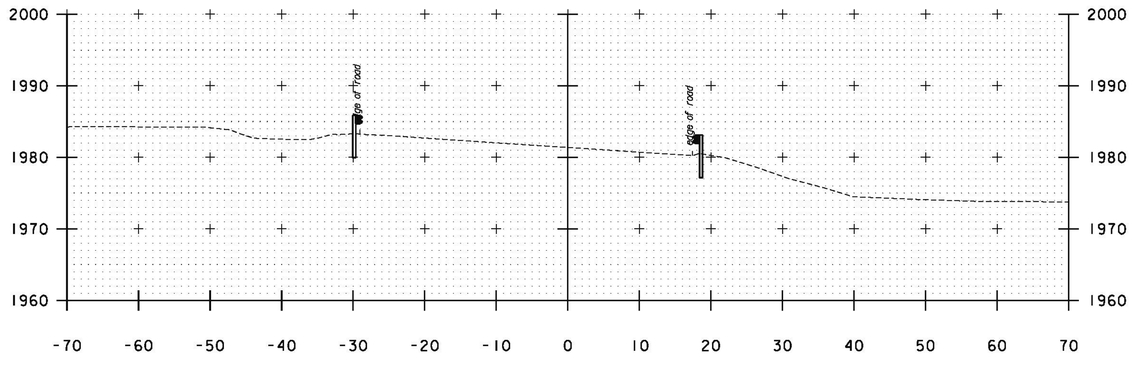
34+91.66 END APPROACH



34+50



34+00



35+00

STA. 34+00 TO STA. 35+00

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

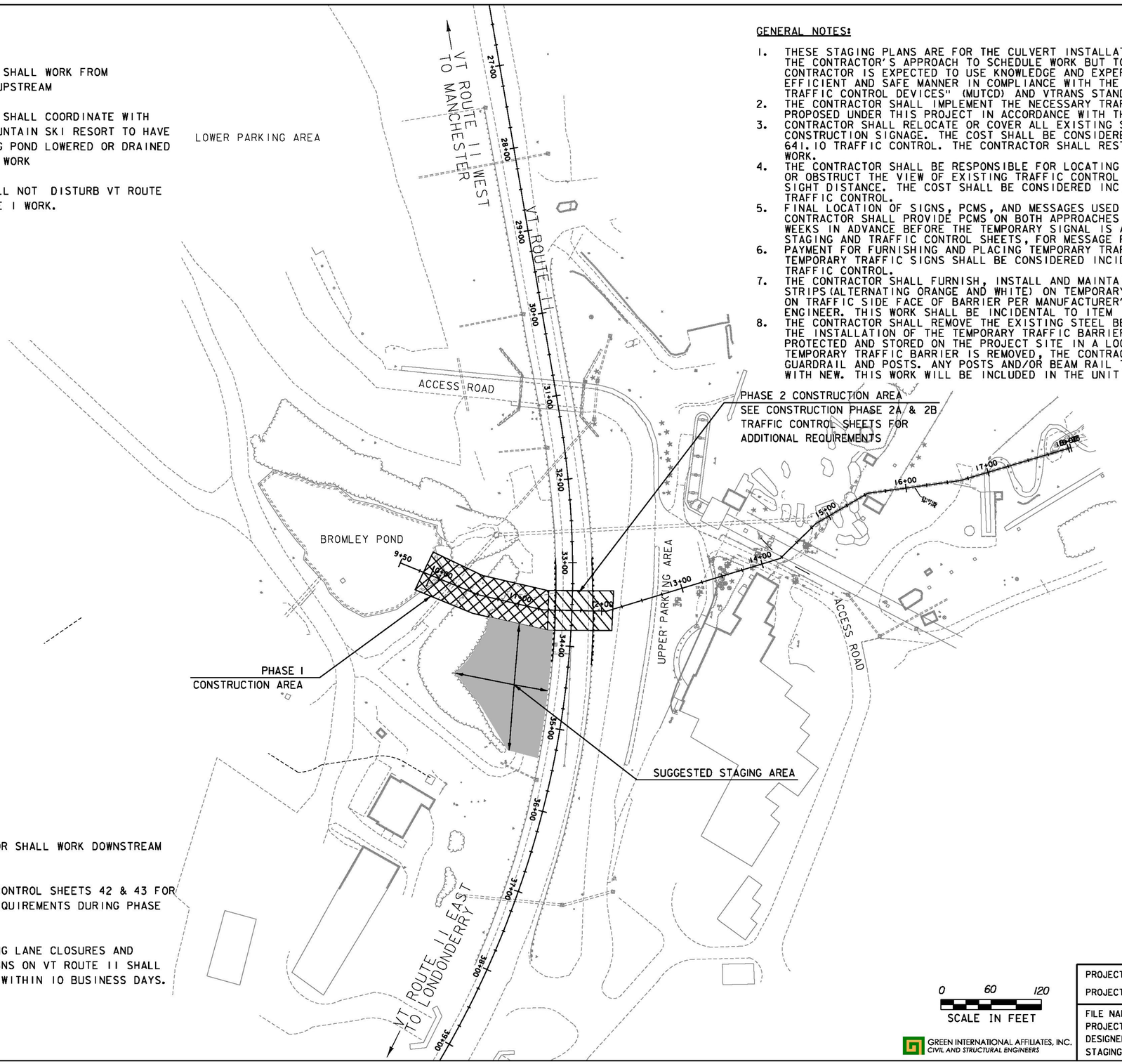
FILE NAME: z07b106xsl.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: M. BRADLEY
CROSS SECTION SHEET 3

PLOT DATE: 12/31/2014
DRAWN BY: M. BRADLEY
CHECKED BY: E. ATKINS
SHEET 40 OF 45

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PHASE 1 NOTES:

1. THE CONTRACTOR SHALL WORK FROM DOWNSTREAM TO UPSTREAM
2. THE CONTRACTOR SHALL COORDINATE WITH THE BROMLEY MOUNTAIN SKI RESORT TO HAVE THE SNOW MAKING POND LOWERED OR DRAINED DURING PHASE 1 WORK
3. CONTRACTOR SHALL NOT DISTURB VT ROUTE 11 DURING PHASE 1 WORK.



GENERAL NOTES:

1. THESE STAGING PLANS ARE FOR THE CULVERT INSTALLATION WORK ONLY AND ARE NOT INTENDED TO LIMIT THE CONTRACTOR'S APPROACH TO SCHEDULE WORK BUT TO OUTLINE ONE WAY OF PROGRESSING. THE CONTRACTOR IS EXPECTED TO USE KNOWLEDGE AND EXPERIENCE TO PERFORM THE WORK IN THE MOST EFFICIENT AND SAFE MANNER IN COMPLIANCE WITH THE LATEST EDITION OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (MUTCD) AND VTRANS STANDARDS.
2. THE CONTRACTOR SHALL IMPLEMENT THE NECESSARY TRAFFIC CONTROL FOR THE OTHER ROADWAY WORK PROPOSED UNDER THIS PROJECT IN ACCORDANCE WITH THE RELEVANT VTRANS STANDARDS AND THE MUTCD.
3. CONTRACTOR SHALL RELOCATE OR COVER ALL EXISTING SIGNS WHERE THEY WOULD CONFLICT WITH CONSTRUCTION SIGNAGE. THE COST SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR ITEM 641.10 TRAFFIC CONTROL. THE CONTRACTOR SHALL RESTORE EXISTING SIGNS AT THE COMPLETION OF THE WORK.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING CONSTRUCTION SIGNAGE SO AS NOT TO INTERFERE OR OBSTRUCT THE VIEW OF EXISTING TRAFFIC CONTROL DEVICES, STOPPING SIGHT DISTANCE AND CORNER SIGHT DISTANCE. THE COST SHALL BE CONSIDERED INCIDENTAL TO UNIT PRICE BID FOR ITEM 641.10 TRAFFIC CONTROL.
5. FINAL LOCATION OF SIGNS, PCMS, AND MESSAGES USED ARE TO BE APPROVED BY THE ENGINEER. THE CONTRACTOR SHALL PROVIDE PCMS ON BOTH APPROACHES OF VT ROUTE 11 DURING CONSTRUCTION AND 2 WEEKS IN ADVANCE BEFORE THE TEMPORARY SIGNAL IS ACTIVATED. REFER TO CONSTRUCTION PHASE 2A & 2B STAGING AND TRAFFIC CONTROL SHEETS, FOR MESSAGE RECOMMENDATIONS.
6. PAYMENT FOR FURNISHING AND PLACING TEMPORARY TRAFFIC SIGNS AND REMOVING AND RELOCATING TEMPORARY TRAFFIC SIGNS SHALL BE CONSIDERED INCIDENTAL TO THE UNIT PRICE BID FOR ITEM 641.10 TRAFFIC CONTROL.
7. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN CORRUGATED REFLECTIVE METAL STRIPS (ALTERNATING ORANGE AND WHITE) ON TEMPORARY TRAFFIC BARRIER. STRIPS SHALL BE INSTALLED ON TRAFFIC SIDE FACE OF BARRIER PER MANUFACTURER'S RECOMMENDATIONS AND AS APPROVED BY THE ENGINEER. THIS WORK SHALL BE INCIDENTAL TO ITEM 621.90, TEMPORARY TRAFFIC BARRIER.
8. THE CONTRACTOR SHALL REMOVE THE EXISTING STEEL BEAM GUARDRAIL AND POSTS AS REQUIRED TO ALLOW THE INSTALLATION OF THE TEMPORARY TRAFFIC BARRIER. THE STEEL BEAM RAIL AND POSTS SHALL BE PROTECTED AND STORED ON THE PROJECT SITE IN A LOCATION AS APPROVED BY THE ENGINEER. WHEN THE TEMPORARY TRAFFIC BARRIER IS REMOVED, THE CONTRACTOR SHALL REINSTALL THE EXISTING STEEL BEAM GUARDRAIL AND POSTS. ANY POSTS AND/OR BEAM RAIL THAT ARE NOT SALVAGEABLE SHALL BE REPLACED WITH NEW. THIS WORK WILL BE INCLUDED IN THE UNIT PRICE BID FOR CONTRACT ITEM ITEM 621.75.

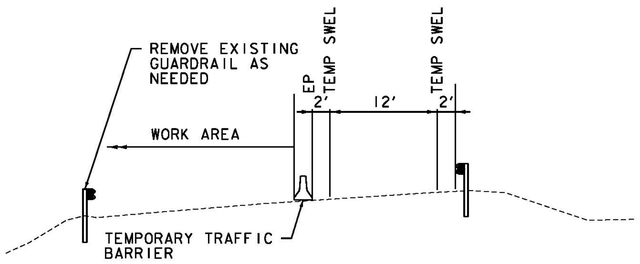
PHASE 2 NOTES:

1. THE CONTRACTOR SHALL WORK DOWNSTREAM TO UPSTREAM.
2. SEE TRAFFIC CONTROL SHEETS 42 & 43 FOR ADDITIONAL REQUIREMENTS DURING PHASE 2.
3. WORK REQUIRING LANE CLOSURES AND TEMPORARY SIGNS ON VT ROUTE 11 SHALL BE COMPLETED WITHIN 10 BUSINESS DAYS.

PHASES 1&2

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106phasebdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
STAGING AND TRAFFIC CONTROL SHEET 1	SHEET 41 OF 45



PHASE 2A TYPICAL ROADWAY SECTION

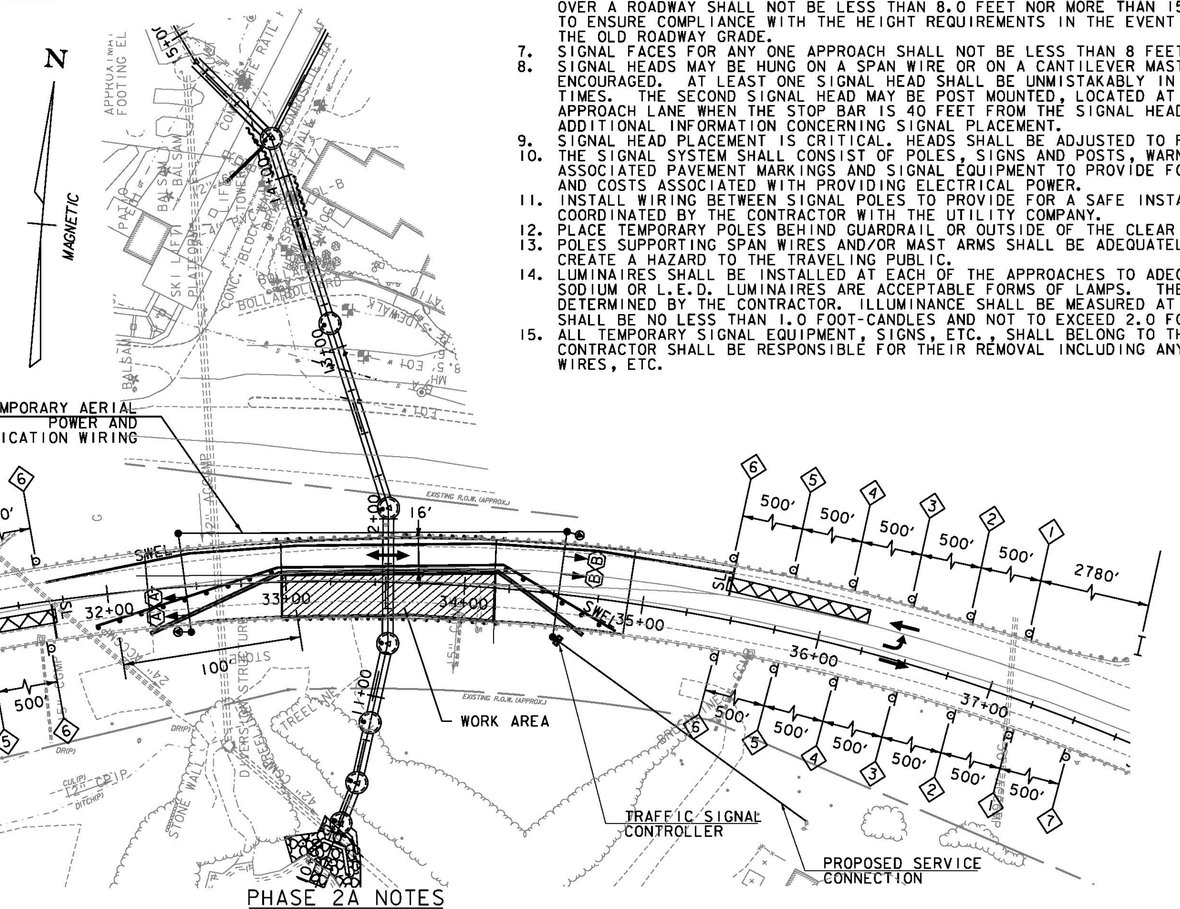
NOT TO SCALE

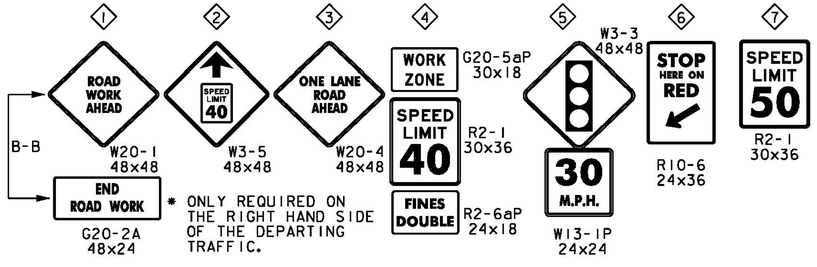
LEGEND

- TEMPORARY TRAFFIC BARRIER
- REFLECTORIZED PLASTIC DRUM
- TRAFFIC FLOW
- SL — TEMPORARY STOP LINE
- SWEL — SOLID WHITE EDGE LINE
- B-B — MOUNTED BACK TO BACK
- DYCL — DOUBLE YELLOW CENTERLINE
- TRAFFIC SIGN
- VIDEO DETECTION CAMERA
- TEMPORARY SPAN WIRE POLE (WOOD UTILITY POLE)
- PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)
- OVERHEAD WIRES
- TEMPORARY TRAFFIC SIGNAL HEAD
- WORK AREA
- VIDEO DETECTION ZONE

TEMPORARY 4INCH WHITE LINE, PAINT
31+66.7 - 35+46.7 LT, 388 LF (SWEL)
31+91.6 - 34+87.2 LT - RT, 306 LF (SWEL)

TEMPORARY 24 INCH STOP BAR, PAINT
31+66.8 RT, 20 LF (SL)
35+46.1 LT, 17 LF (SL)





TEMPORARY TRAFFIC SIGNAL SYSTEM NOTES

1. THE TIMING OF THE TEMPORARY SIGNAL SHALL BE SUBJECT TO FIELD ADJUSTMENTS AS NEEDED OR AS DIRECTED BY THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR ANY NECESSARY ADJUSTMENTS TO TIMINGS APPROVED BY THE ENGINEER. THIS WORK SHALL BE INCIDENTAL TO ITEM 678.40, TEMPORARY TRAFFIC SIGNAL SYSTEM.
2. UNIFORMED TRAFFIC OFFICERS SHALL BE NOTIFIED IMMEDIATELY AND SHALL PERFORM TRAFFIC CONTROL IN THE EVENT THAT THE TEMPORARY TRAFFIC SIGNAL IS OUT OF ORDER.
3. TEMPORARY TRAFFIC CONTROL SIGNAL SHALL BE INCLUDED FOR PAYMENT UNDER ITEM 678.40 TEMPORARY TRAFFIC SIGNAL SYSTEM AND SHALL INCLUDE ALL TEMPORARY TRAFFIC CONTROL ITEMS INCLUDING BUT NOT LIMITED TO TEMPORARY SIGNALS, VIDEO DETECTION SYSTEM, SERVICE CONNECTION, SIGNAL HEADS, REMOVING SIGNALS AT THE COMPLETION OF WORK AND ALL OTHER INCIDENTALS NECESSARY TO FURNISH, INSTALL AND MAINTAIN THE TEMPORARY TRAFFIC SIGNAL SYSTEM.
4. DESIGN OF THE SIGNAL SUPPORTS AND ANY REQUIRED GUYING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
5. SIGNAL FACES SHALL BE L.E.D AND CONSIST OF 12" LENSES (RED, YELLOW AND GREEN).
6. THE BOTTOM OF THE HOUSING OF A SIGNAL FACE SUSPENDED OVER A ROADWAY SHALL NOT BE LESS THAN 16.5 FEET NOR MORE THAN 19.0 FEET ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY. THE BOTTOM OF A SIGNAL FACE NOT MOUNTED OVER A ROADWAY SHALL NOT BE LESS THAN 8.0 FEET NOR MORE THAN 15.0 FEET ABOVE THE GROUND. CAUTION SHOULD BE USED TO ENSURE COMPLIANCE WITH THE HEIGHT REQUIREMENTS IN THE EVENT THE NEW APPROACH GRADES DIFFER SIGNIFICANTLY FROM THE OLD ROADWAY GRADE.
7. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER FACES.
8. SIGNAL HEADS MAY BE HUNG ON A SPAN WIRE OR ON A CANTILEVER MAST ARM. HOWEVER, THE USE OF PORTABLE SIGNALS IS ENCOURAGED. AT LEAST ONE SIGNAL HEAD SHALL BE UNMISTAKABLY IN LINE WITH THE CENTER OF APPROACHING TRAFFIC AT ALL TIMES. THE SECOND SIGNAL HEAD MAY BE POST MOUNTED, LOCATED AT A DISTANCE OF 14.5 FEET FROM THE CENTER OF THE APPROACH LANE WHEN THE STOP BAR IS 40 FEET FROM THE SIGNAL HEAD. CONSULT THE LATEST EDITION OF THE MUTCD FOR ADDITIONAL INFORMATION CONCERNING SIGNAL PLACEMENT.
9. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES.
10. THE SIGNAL SYSTEM SHALL CONSIST OF POLES, SIGNS AND POSTS, WARNING SIGNS, LUMINAIRES, FLASHING BEACONS, ASSOCIATED PAVEMENT MARKINGS AND SIGNAL EQUIPMENT TO PROVIDE FOR AN ADEQUATE DESIGN. IT ALSO INCLUDES PERMITS AND COSTS ASSOCIATED WITH PROVIDING ELECTRICAL POWER.
11. INSTALL WIRING BETWEEN SIGNAL POLES TO PROVIDE FOR A SAFE INSTALLATION. ATTACHMENT TO UTILITY POLES SHALL BE COORDINATED BY THE CONTRACTOR WITH THE UTILITY COMPANY.
12. PLACE TEMPORARY POLES BEHIND GUARDRAIL OR OUTSIDE OF THE CLEAR ZONE.
13. POLES SUPPORTING SPAN WIRES AND/OR MAST ARMS SHALL BE ADEQUATELY BRACED OR GUYED AND SHALL NOT BE PLACED SO AS TO CREATE A HAZARD TO THE TRAVELING PUBLIC.
14. LUMINAIRES SHALL BE INSTALLED AT EACH OF THE APPROACHES TO ADEQUATELY LIGHT THE STOP BAR AREAS. HIGH PRESSURE SODIUM OR L.E.D. LUMINAIRES ARE ACCEPTABLE FORMS OF LAMPS. THE MOUNTING HEIGHT OF THE LUMINAIRES SHALL BE THE DETERMINED BY THE CONTRACTOR. ILLUMINANCE SHALL BE MEASURED AT NIGHTTIME AFTER INSTALLATION AND AT EACH STOP BAR SHALL BE NO LESS THAN 1.0 FOOT-CANDLES AND NOT TO EXCEED 2.0 FOOT-CANDLES.
15. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC., SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR REMOVAL INCLUDING ANY TEMPORARY PAVEMENT MARKINGS, UTILITY POLES, WIRES, ETC.

ADVANCE NOTIFICATION PCMS DISPLAY

ROAD WORK AHEAD
BEGINS APRIL 15

MONTH AND DATE SHOWN ON PCMS ARE FOR ILLUSTRATION ONLY

NOTE

SEE PHASE 2B PLAN SHEET FOR PROPOSED SIGNAL FACE ARRANGEMENT, MAJOR EQUIPMENT LIST, PROPOSED SIGNAL PHASING, TABLE OF CHANGE SEQUENCE, AND CONTROLLER TIMING CHART.

PHASE 2A NOTES

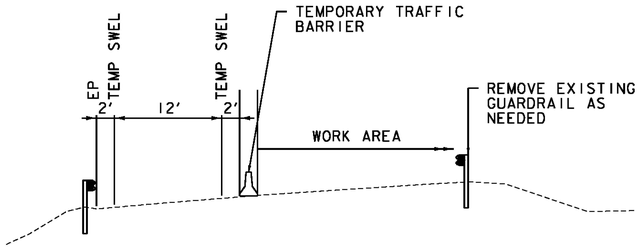
1. INSTALL TEMPORARY TRAFFIC CONTROL SIGNS, SIGNALS, AND BARRIERS AS SHOWN ON THIS PLAN.
2. MASK EXISTING PAVEMENT MARKINGS THAT ARE IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS SHOWN ON THIS PLAN. MASK SHALL BE DONE WITH TRAFFIC TAPE OR REMOVE PAVEMENT MARKINGS VIA GRINDING ONLY. PAINT OR ASPHALT CEMENT ARE NOT ALLOWED. MATCH PROPOSED PAVEMENT MARKINGS WITH EXISTING PAVEMENT MARKINGS AT LIMIT OF WORK.
3. INSTALL TEMPORARY PAVEMENT MARKINGS, AND MAINTAIN ONE LANE ALTERNATING TRAFFIC WITH A MINIMUM OF 12 FOOT WIDE TRAVEL LANE WITH 2 FOOT SHOULDER ON EACH SIDE.
4. REMOVE EXISTING GUARDRAIL AS NEEDED TO INSTALL PROPOSED DRAINAGE.
5. PERFORM EXCAVATION, COLD PLANING, INSTALL PROPOSED DRAINAGE, PAVEMENT, TIMBER CURB AND RESET EXISTING HIGHWAY GUARDRAIL.
6. THE DRAINAGE PIPE INSTALLED ON THIS PHASE SHALL BE SUFFICIENT TO ALLOW ONE 12 FOOT LANE WITH 2 FOOT SHOULDERS ON BOTH SIDES FOR ALTERNATING TRAFFIC AS SHOWN ON PHASE 2B.
7. REMOVE TEMPORARY BARRIERS AND TEMPORARY PAVEMENT MARKINGS AFTER COMPLETION OF PHASE 2A WORK AND RESET TO LOCATION FOR PHASE 2B. RETAIN TEMPORARY SIGNAL AND SIGNS FOR USE IN PHASE 2B.

0 40 80
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PHASE 2A

PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106tmpbdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E. ATKINS	DRAWN BY: D. VERTIYEV
DESIGNED BY: A. ACHARYA	CHECKED BY: E. ATKINS
STAGING AND TRAFFIC CONTROL SHEET 2	SHEET 42 OF 45



PHASE 2B TYPICAL ROADWAY SECTION

NOT TO SCALE

TEMPORARY 4INCH WHITE LINE, PAINT
31+68.4 - 35+08.5 RT, 337 LF (SWEL)
32+22.4 - 35+25.8 RT-LT, 328 LF (SWEL)

TEMPORARY 24 INCH STOP BAR, PAINT
31+66.8 RT, 20 LF (SL)
35+46.1 LT, 17 LF (SL)

MAJOR EQUIPMENT LIST

EQUIPMENT ITEM NO. 678.40	US ROUTE 11
CONTROLLER/CABINET (POLE MOUNTED)	1
TEMPORARY SPAN WIRE POLE (WOOD UTILITY POLE)	4
SIGNAL HEAD 1WAY 3-SECTION A,B	4
VIDEO DETECTION SYSTEM	1

PROPOSED SIGNAL PHASING

VT ROUTE 11

TABLE OF CHANGE SEQUENCE

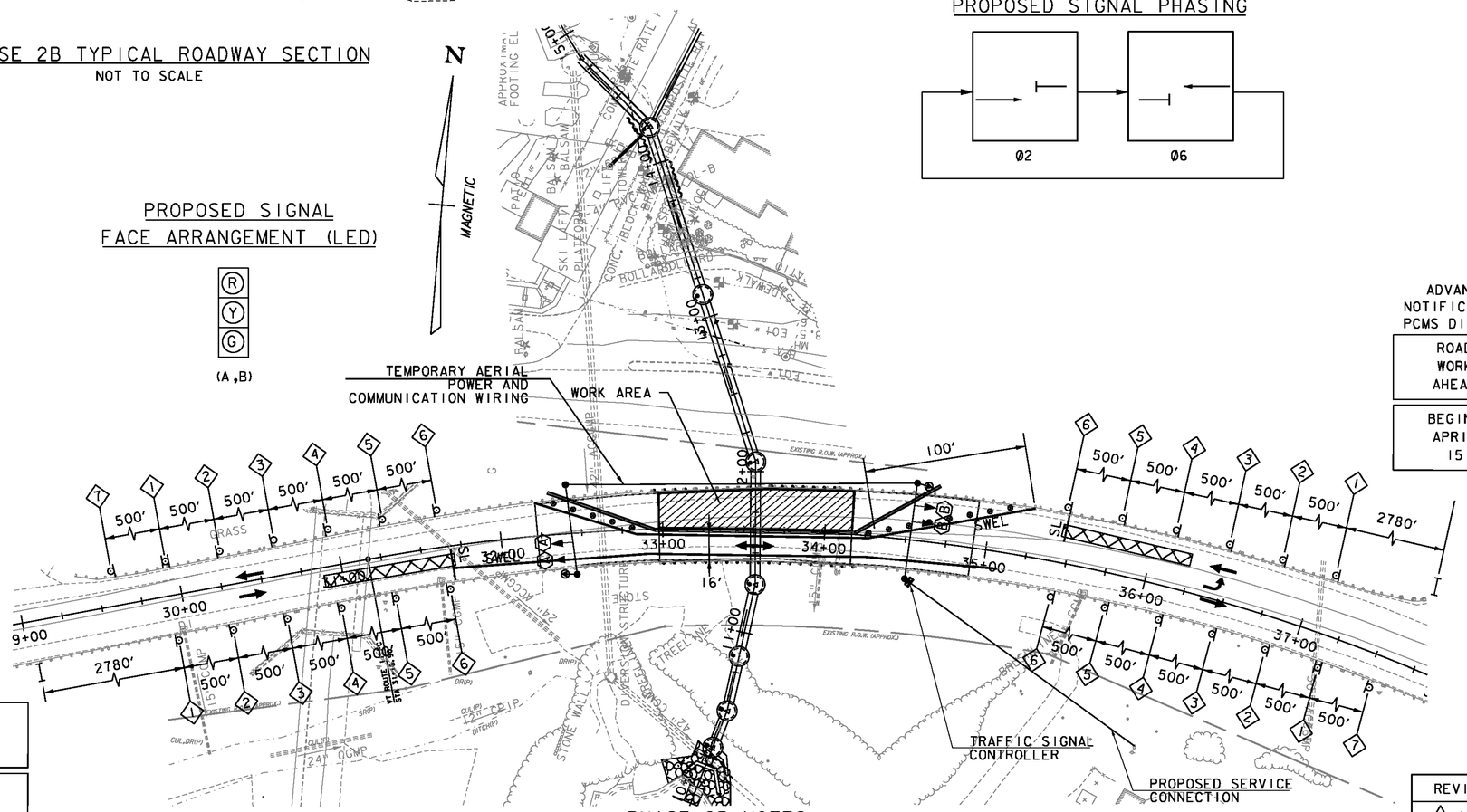
	Ø2			Ø6			
FACE	R/W	CLEAR TO ALL OTHER PHASES		R/W	CLEAR TO ALL OTHER PHASES		FLASHING OPERATION
A	G	Y	R	R	R	R	FR
B	R	R	R	G	Y	R	FR

NOTE

SEE SHEETS 41-42 FOR NOTES AND LEGEND.

PROPOSED SIGNAL FACE ARRANGEMENT (LED)

(A,B)



ADVANCE NOTIFICATION PCMS DISPLAY

ROAD WORK AHEAD

BEGINS APRIL 15

US ROUTE 11

CONTROLLER TIMING CHART

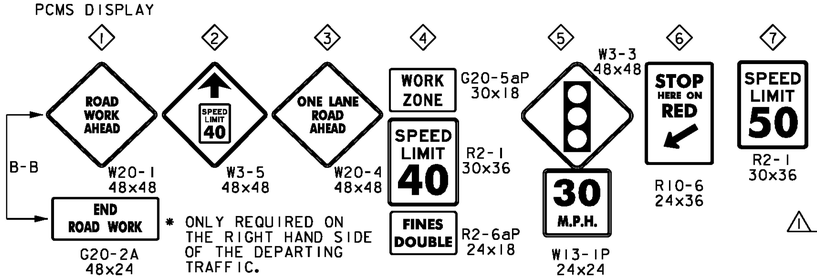
LOCAL PROGRAMMING	PHASE 2	PHASE 6
MINIMUM GREEN	5	5
PASSAGE/VEHICLE EXT	3	3
YELLOW CLEARANCE	4.5	4.5
ALL RED CLEARANCE	13	13
MAX. 1 GREEN-80 SEC	25.5	25.5
RECALL	MIN	MIN

NOTE: 01,03,04,05,07,08 ARE NOT IN USE

ROAD WORK AHEAD

BEGINS APRIL 15

ADVANCE NOTIFICATION PCMS DISPLAY



* ONLY REQUIRED ON THE RIGHT HAND SIDE OF THE DEPARTING TRAFFIC.

PHASE 2B NOTES

1. RETAIN TEMPORARY SIGNAL AND CONSTRUCTION SIGNING UTILIZED ON PHASE 2A.
2. RESET TEMPORARY CONCRETE BARRIER AS SHOWN ON THIS PLAN.
3. MASK EXISTING PAVEMENT MARKINGS IN CONFLICT WITH THE TEMPORARY PAVEMENT MARKINGS SHOWN ON THIS PLAN. MASK SHALL BE DONE WITH TRAFFIC TAPE OR REMOVE PAVEMENT MARKINGS VIA GRINDING ONLY. PAINT OR ASPHALT CEMENT ARE NOT ALLOWED. MATCH PROPOSED PAVEMENT MARKINGS WITH EXISTING PAVEMENT MARKINGS AT LIMIT OF WORK.
4. INSTALL TEMPORARY PAVEMENT MARKINGS, AND MAINTAIN ONE LANE ALTERNATING TRAFFIC WITH A MINIMUM OF 12 FOOT WIDE TRAVEL LANE WITH 2 FOOT SHOULDER ON EACH SIDE.
5. REMOVE EXISTING HIGHWAY GUARDRAILS AS NEEDED TO INSTALL PROPOSED DRAINAGE.
6. PERFORM EXCAVATION TO INSTALL PROPOSED BARRIER AND DRAINAGE.
7. INSTALL PROPOSED DRAINAGE AND RESET EXISTING HIGHWAY GUARDRAIL.
8. A MINIMUM OF THE BASE COURSE AND INTERMEDIATE COURSE OF PAVEMENT SHALL BE IN PLACE PRIOR TO REMOVAL OF TEMPORARY TRAFFIC CONTROL. PROVIDE A 1-INCH IN 50-FEET APPROACH TAPER FROM INTERMEDIATE COURSE TO EXISTING PAVEMENT. THE COST FOR THIS TAPER SHALL BE INCIDENTAL TO THE CONTRACT. ⚠
9. REMOVE TEMPORARY SIGNAL, PAVEMENT MARKING, SIGNAGE, AND BARRIERS.
10. RESTRIPE TO ORIGINAL CONDITION AND REMOVE PAVEMENT MARKING MASK. RESTORE THE NORMAL TRAFFIC OPERATION AT THE COMPLETION OF PHASE 2B WORK. ⚠
11. PAVEMENT SHALL BE RESTORED TO MATCH THE TYPICAL SECTIONS PRIOR TO PROJECT COMPLETION.

REVISION	BY	DATE
⚠1 NOTE 8 REVISED AND NOTE 11 ADDED	MAB	2/10/2015

0 40 80

SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PHASE 2B

PROJECT NAME: PERU
PROJECT NUMBER: STP SCRP(4)

FILE NAME: z07b106tmpbdr.dgn
PROJECT LEADER: E. ATKINS
DESIGNED BY: A. ACHARYA
STAGING AND TRAFFIC CONTROL SHEET 3

PLOT DATE: 12/31/2014
DRAWN BY: D. VERTIYEV
CHECKED BY: E. ATKINS

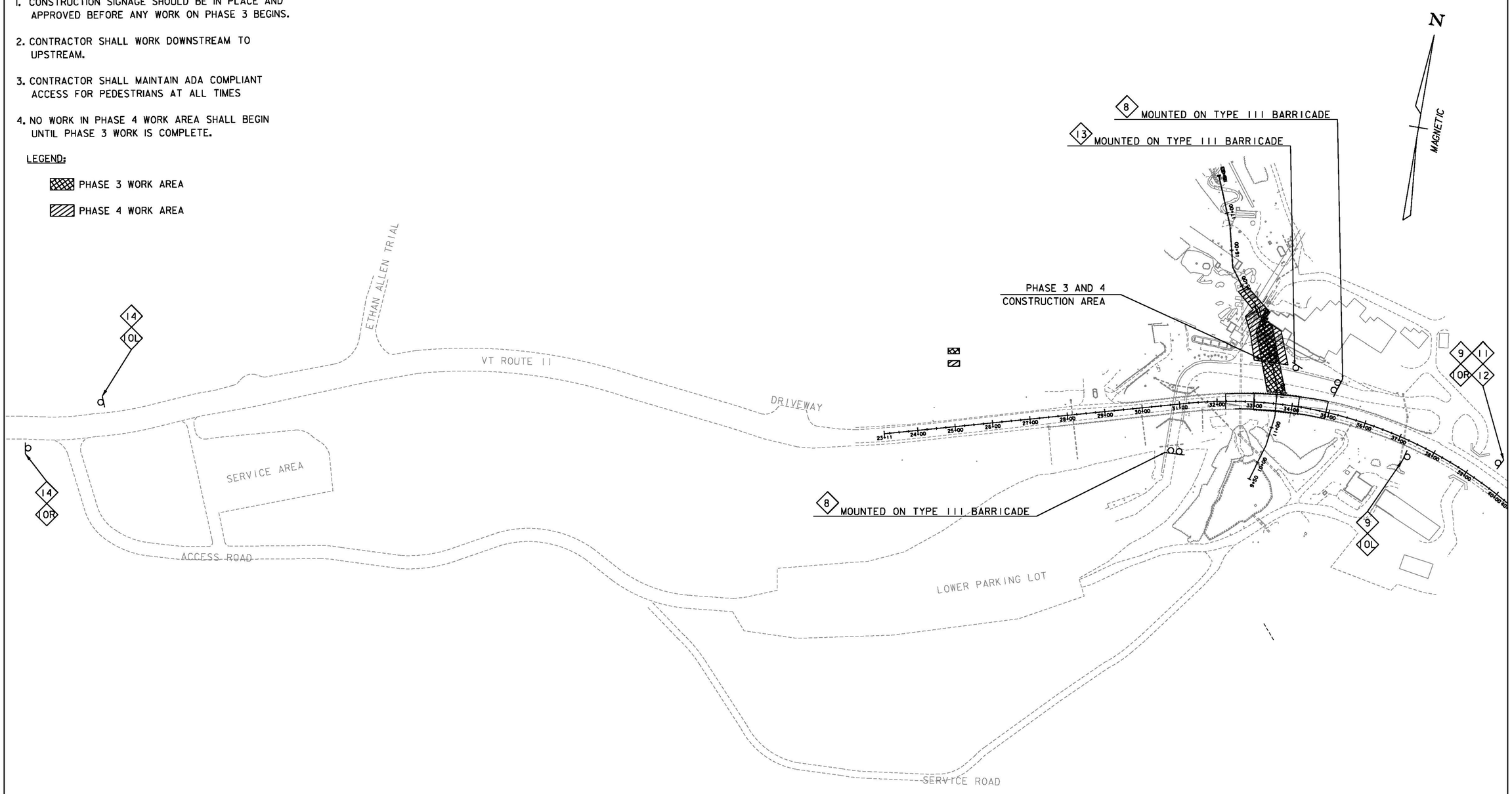
PHASE 3 NOTES:

1. CONSTRUCTION SIGNAGE SHOULD BE IN PLACE AND APPROVED BEFORE ANY WORK ON PHASE 3 BEGINS.
2. CONTRACTOR SHALL WORK DOWNSTREAM TO UPSTREAM.
3. CONTRACTOR SHALL MAINTAIN ADA COMPLIANT ACCESS FOR PEDESTRIANS AT ALL TIMES
4. NO WORK IN PHASE 4 WORK AREA SHALL BEGIN UNTIL PHASE 3 WORK IS COMPLETE.

LEGEND:

PHASE 3 WORK AREA

PHASE 4 WORK AREA



8 **ROAD CLOSED** R11-2 48 X 30

9 **HANDICAPPED PARKING AND DELIVERIES ONLY** 60 X 24

10 M6-1L OR M6-1R 21 X 15

11 **MAIN PARKING ENTRANCE CLOSED AHEAD USE NEXT ENTRANCE 3/4 MILE** 42 X 30

12 M6-3 21 X 15

13 **SIDEWALK CLOSED** M9-9 24 X 12

14 **BROMLEY MOUNTAIN PARKING** 30 X 24

0 125 250

SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PHASES 3&4

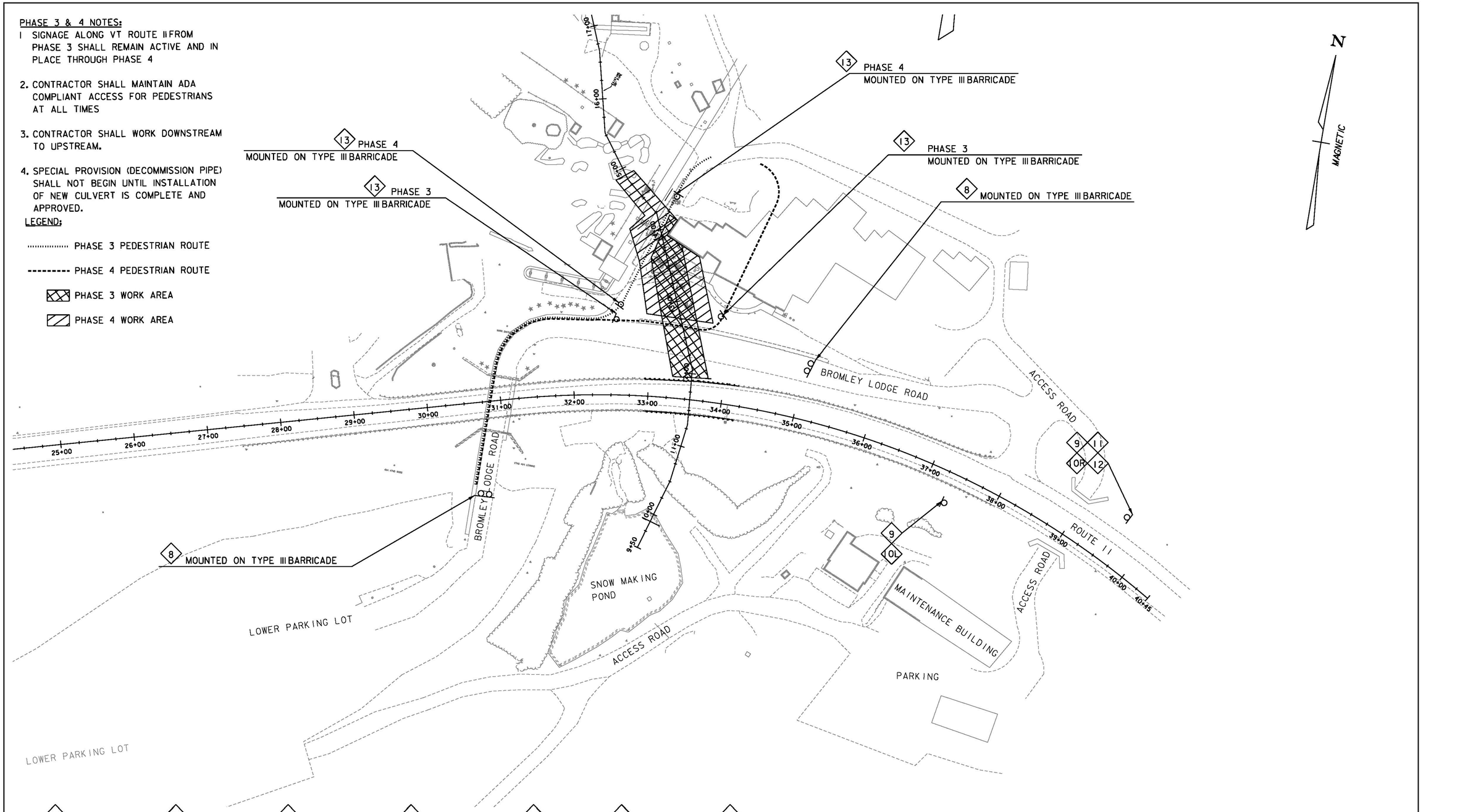
PROJECT NAME: PERU	
PROJECT NUMBER: STP SCRP(4)	
FILE NAME: z07b106phasebdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E.ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
STAGING AND TRAFFIC CONTROL SHEET 4	SHEET 44 OF 45

PHASE 3 & 4 NOTES:

1. SIGNAGE ALONG VT ROUTE 11 FROM PHASE 3 SHALL REMAIN ACTIVE AND IN PLACE THROUGH PHASE 4
2. CONTRACTOR SHALL MAINTAIN ADA COMPLIANT ACCESS FOR PEDESTRIANS AT ALL TIMES
3. CONTRACTOR SHALL WORK DOWNSTREAM TO UPSTREAM.
4. SPECIAL PROVISION (DECOMMISSION PIPE) SHALL NOT BEGIN UNTIL INSTALLATION OF NEW CULVERT IS COMPLETE AND APPROVED.

LEGEND:

- ..... PHASE 3 PEDESTRIAN ROUTE
- ---------- PHASE 4 PEDESTRIAN ROUTE
- PHASE 3 WORK AREA
- PHASE 4 WORK AREA



8 — ROAD CLOSED — R11-2, 48 X 30

9 — HANDICAPPED PARKING AND DELIVERIES ONLY — 60 X 24

10 — M6-1L OR M6-1R, 21 X 15

11 — MAIN PARKING ENTRANCE CLOSED AHEAD USE NEXT ENTRANCE ¾ MILE — 42 X 30

12 — M6-3, 21 X 15

13 — SIDEWALK CLOSED — M9-9, 24 X 12

14 — BROMLEY MOUNTAIN PARKING — 30 X 24

0 60 120
SCALE IN FEET

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

PHASES 3&4

PROJECT NAME:	PERU
PROJECT NUMBER:	STP SCRP(4)
FILE NAME: z07b106phasebdr.dgn	PLOT DATE: 12/31/2014
PROJECT LEADER: E.ATKINS	DRAWN BY: M. BRADLEY
DESIGNED BY: M. BRADLEY	CHECKED BY: E. ATKINS
STAGING AND TRAFFIC CONTROL SHEET 5	SHEET 45 OF 45

This review is for the 72x72 Waterman Model QS-5000-F-Y Sluice Gate Fabrication Drawing dated August 18, 2017 and revised November 7, 2017 and the revised calculations dated November 7, 2017

SUBMITTAL REVIEW

	APPROVED
X	APPROVED AS NOTED
	REVISE AND RESUBMIT
	REJECTED

CHECKING IS ONLY FOR GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. ANY ACTION SHOWN IS SUBJECT TO THE REQUIREMENTS OF THE PLANS AND SPECIFICATIONS. CONTRACTOR IS RESPONSIBLE FOR DIMENSIONS WHICH SHALL BE CONFIRMED AND CORRELATED AT THE JOB SITE; FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATION OF HIS WORK WITH THAT OF ALL OTHER TRADES; AND THE SATISFACTORY PERFORMANCE OF THE WORK.

See the following sheets for the comments

GREEN INTERNATIONAL AFFILIATES, INC.
CIVIL AND STRUCTURAL ENGINEERS

CHECKED BY DV/BK DATE 11/15/17

SIGNED BY EA/BK DATE 11/15/17

Approved AsNoted

BY:	Ken Upmal
DATE:	11/29/2017
RESUBMIT:	NO
RECEIVED:	November 13, 2017
CKD BY:	DV/BK (Green Int'l.)

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EMBEDDED DEPTH FOR ALL THREADED STUDS			
DIAMETER	EMBEDDED DEPTH	HOLE DEPTH	HOLE DIA.
3/4	14	11-1/4	7/8

4

Contractor to field verify all elevations and dimensions with as built conditions.

Contractor to confirm in the field that adequate clearance will be provided.

NOTE:
HANDRAIL BY OTHERS (NOT SHOWN)
CONTRACTOR TO ENSURE CLEARANCE
FOR HANDCRANK OPERATION.

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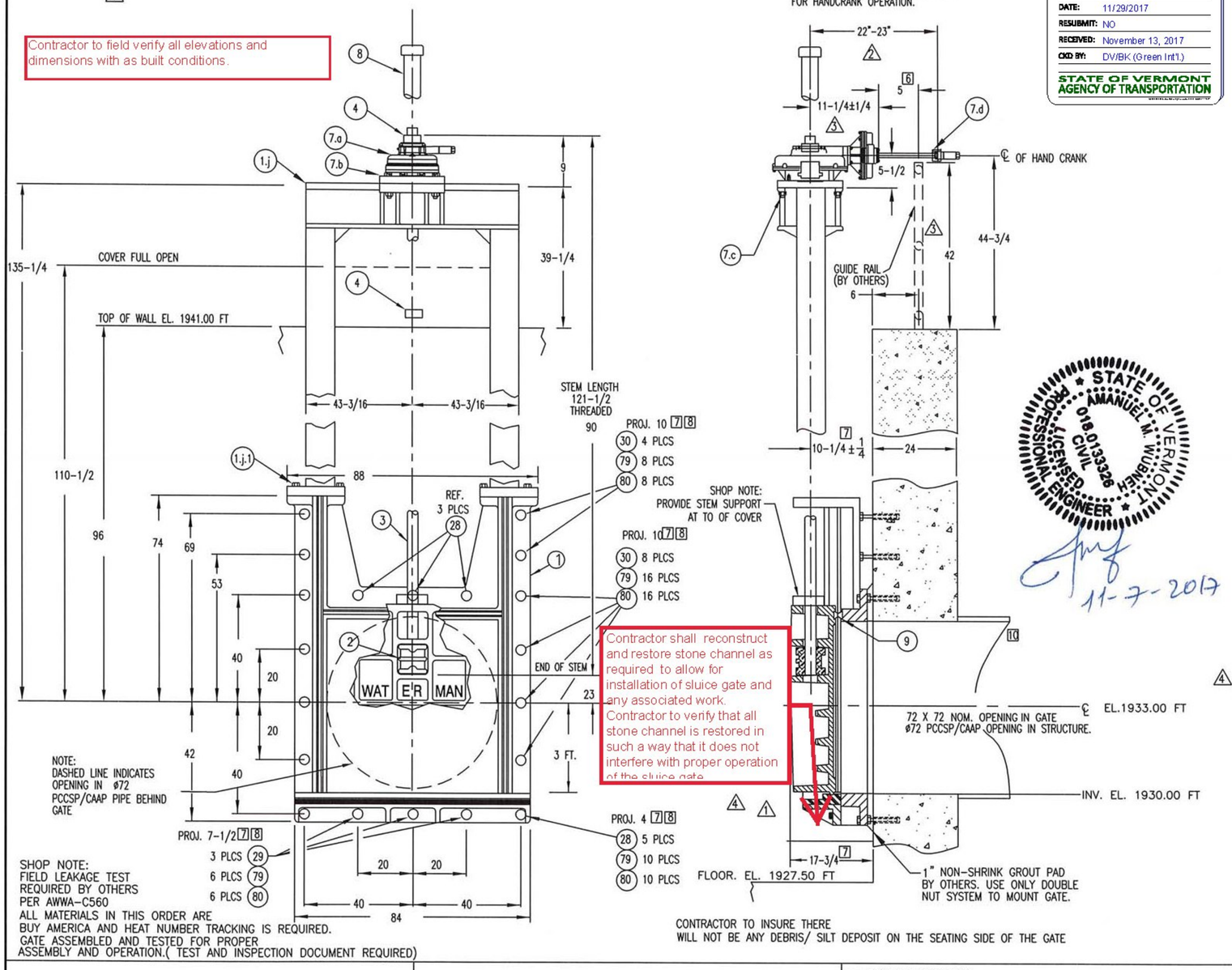

STATE OF VERMONT * AMANUEL M. WUBNEH * 018.0133326 CIVIL * LICENSED PROFESSIONAL ENGINEER *
11-7-2017

MATERIAL KEY	FINISH KEY	PAINT KEY
1. CAST IRON:ASTM A-126 CL. B 4. MANG. BRZ.:ASTM B-584 AL. C86500 5. NAVAL BRZ.:ASTM B-21 AL. C48200 9B. STN STL SHAPES:ASTM A-276 TY.316/316L D/C 13. NEOPRENE RUBBER:ASTM D-2000 14. CLEAR PLASTIC BUTYRATE PIPE:ASTM D-707 15B. STN STL HDW:ASTM F-593G/H & 594 GRP 2 (TY 316) 20. CAST ALUMINUM: ASTM B-26 35A. PVC PLASTIC PIPE:ASTM D-1785	1. AS CAST 2. MILL 3. MACHINED 4. GALVANIZE-ASTM A-123 5. GALVANIZE-ASTM A-153 6. SEE PAINT KEY 7. ZINC PLATED	6E BLAST CLEAN PER SSPC-SP10 PRIME (1) CT (3 MILS) & PAINT (2) CTS (4 MILS/CT) TDFT-11 MILS POLYAMIDE EPOXY COLOR: GRAY 6H-L VENDOR PRIME COAT 6 (2) CTS POLYAMIDE EPOXY PAINT & (1) CT POLYURETHANE ENAMEL (TDFT-7 MILS) COLOR: GRAY 6 6H BLAST CLEAN PER SSPC-SP6 (2) CTS POLYAMIDE EPOXY PAINT & (1) CT POLYURETHANE ENAMEL (TDFT-7 MILS) COLOR: GRAY 6

ITEM	DESCRIPTION	MATERIAL KEY	FINISH KEY	PART NO. OR SIZE (FOR WATERMAN USE ONLY)	QTY/ GATE	TOTAL QTY
1.	SLUICE GATE ASSEMBLY - 72x72 QS-5000-F	–	–	REF. 100103	1	1
a)	FRAME	1	6E	W-5477-01-01	1	
b)	COVER	1	6E	W-5480-02-01	1	
c)	SEAT	5	2	1-1/8 IN WIDE EXT. (REF. 100077)	A/R	
d)	GUIDE RAIL	1	6E	W-5096 L&R	1 EA	
e)	SIDE WEDGE ASSEMBLY	–	–	SYSTEM B (REF. 100067)	4 EA	
1)	FRAME WEDGE	4	1,3	W-5004 L&R (REF. 100065)	4 EA	
2)	COVER WEDGE	4	1,3	W-5139 L&R (REF. 100066)	4 EA	
3)	ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
f)	TOP WEDGE ASSEMBLY	–	–	REF. 100074	4	
1)	TOP WEDGE	4	1,3	W-5006 (REF. 100069)	4	
2)	WEDGE BLOCK BRACKET	4	1,3	W-5007 (REF. 100070)	4	
3)	ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
h)	FLUSHBOTTOM ASSEMBLY	–	–	REF. 102982	1	
1)	BRACKET	1	6E	W-5156-00-01	1 EA.	-
2)	SEAL	13	2	76 INCHES (REF. 102981)	1	
3)	SEAL RETAINER	9B	2	–	1	
4)	ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
j)	YOKE	1	6E	REF. 105207	1	
1)	ASSEMBLY / ADJUSTING HARDWARE	15B	2	–	A/R	
2.	THRUST NUT (W-5014)	4	2,3	2-1/2 DIA, 4 TPI, LH (REF. 101224-91) 5	1	1
3.	STEM (RISING)	9B	2	2-1/2 DIA, 4 TPI, LH (REF. 108130-1) 5	1	1
4.	LIMIT NUT	1	5	2-1/2 DIA, 4 TPI, LH (REF. 108222-11) 5	2	2
7.	LIFT ASSEMBLY	–	–	–	1	1
a)	LIFT	1,4	6H-L	TYPE IB7/AS3 12:1 MOD.EXTEND SHAFT INPUT BY 6 INCHES	1	
b)	BASEPLATE	6	6H	CUSTOM FA16 BASEPLATE (SEE BUILD PLANS)	1	
c)	HEX HEAD BOLT & WASHER	15B	2	3/4 NC X 4-1/2 LG.	8/8	
d)	HANDCRANK (15 INCH RADIUS)	20,35A	2,3	REF. 109919	1	
8.	STEM COVER (W/ MYLAR STRIP)	14,35A	2	REF. 102787 (4 in) 78 LG.	1	1
9.	STEM COVER ADAPTOR	6,11	4	REF. 104041	1	1
4 28.	ALL THREADED STUD 8	9B	2,3	3/4 NC X 18 LG.	5	5
29.	ALL THREADED STUD 8	9B	2,3	3/4 NC X 21-1/2 LG.	3	3
30.	ALL THREADED STUD 8	9B	2,3	3/4 NC X 24 LG.	12	12
79.	HEX NUT	15B	2	3/4 NC	40	40
80.	WASHER	316 SS	2	3/4 DIA.	40	40

NOTES: UNLESS OTHERWISE SPECIFIED.
1. (GATE CAPACITY) MAXIMUM SEATING HEAD = 51 FT.; MAXIMUM UNSEATING HEAD = 20 FT.
2. OPERATING HEAD FROM GATE CENTER LINE: SEATING HEAD = 15 FT.; UNSEATING HEAD = 15 FT. 6
3. LIFT CAPACITY = 15340 LBS @ 25 LBS PULL.
4. TURN HANDWHEEL CCW TO OPEN (RAISE) GATE.
5. 29° MODIFIED STUB ACME THREADS.
6. CONTRACTOR TO VERIFY OR SUPPLY.
7. DIMENSION INCLUDES GROUT PAD THICKNESS.
8. CONTRACTOR TO PROVIDE HILTI HIT-RE 500-V3 (WET OR DRY CONDITIONS), HILTI HY-200 (DRY CONDITIONS ONLY); OR EQUAL.
9. IMPACT INTO DOVETAIL GROOVE/ MACHINE FLAT TO .002 T.I.R. WITH A 63 FINISH OR BETTER.

(1) GATE REQ'D @ STP SCRP(4) 6

REF. PLAN SHEET: 9 OF 45

Waterman® INDUSTRIES
P.O. BOX 458 * 25500 Road 204 * Exeter, California 93221 * Phone (559)562-4000 * FAX (559)562-2277 * www.watermanusa.com

72 X 72 WATERMAN MODEL QS-5000-F-Y SLUICE GATE

FOR: RENAUD BROS.,INC
283 FORT BRIDGMAN RD#2
VERNON,VT 05354

PO: SIGNED QUOTE 8/9/17

REF: AGENCY OF TRANSPORTATION

ENG:

REV.NO.	DATE	BY	JOB NO.	PROJECT MANAGER
			M028960C	FRANK SOTO
4	(ANCHOR. REV.) NOV. 07, '17 AMW	FS	QUOTE NO. WQ17-H-28960C	DRAWN BY AMW / CHK'D BY REM / ENGINEER AMW
3	(CUST. REV.) SEPT.. 05, '17 AMW	FS	QUOTE ITEM NO. 1	SHEET 1 OF 1
2	(CUST. REV.) AUG. 31, '17 AMW	FS	SCALE NTS	DATE AUG. 18, '17
1	(CUST. REV.) AUG. 29, '17 AMW	FS	DRAWING NO. RB-17-0487	

V:\Draw\RB-17-0487.dwg Nov 07, 2017 - 6:13pm

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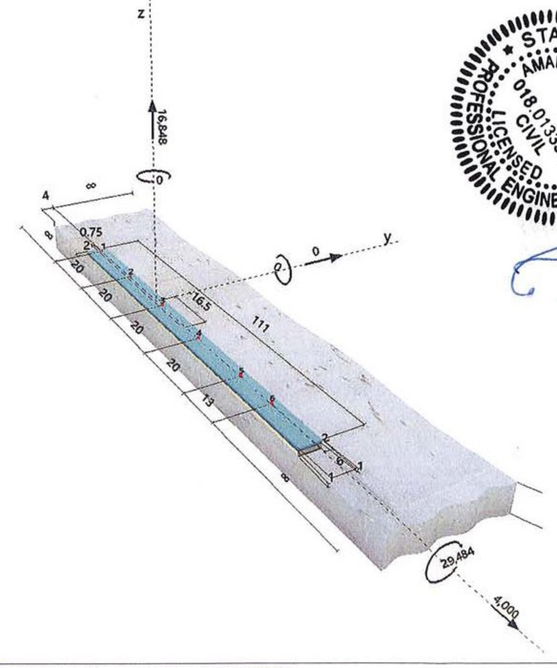
Company:	Waterman Industries	Page:	1
Specifier:	Amanuel Wubneh P.E.	Project:	Renaud Bros,Inc.
Address:	25500 Road 204	Sub-Project I Pos. No.:	RB-17-0351 Rev.1
Phone I Fax:	(800) 331-0808 | (559) 562-8629	Date:	11/7/2017
E-Mail:	amanuel.wubneh@watermanusa.com		

Specifier's comments: verified concrete stregth is 3500 psi.

1 Input data

Anchor type and diameter:	**HIT-RE 500 V3 + HAS-R 316 SS 3/4**
Effective embedment depth:	$h_{ef,act}$ = 14.000 in. ($h_{ef,limit}$ = - in.)
Material:	ASTM F 593
Evaluation Service Report:	ESR-3814
Issued I Valid:	1/1/2017 | 1/1/2019
Proof:	Design method ACI 318-11 / Chem
Stand-off installation:	without clamping (anchor); restraint level (anchor plate): 2.00; e_b = 1.000 in.; t = 1.000 in.
	Hilti Grout: CB-G PG (50), precision, $f_{c,Grout}$ = 10443 psi
Anchor plate:	l_x x l_y x t = 111.000 in. x 6.000 in. x 1.000 in.; (Recommended plate thickness: not calculated
Profile:	no profile
Base material:	cracked concrete, , f_c' = 3500 psi; h = 24.000 in., Temp. short/long: 100/110 °F
Installation:	**hammer drilled hole, Installation condition: Dry**
Reinforcement:	tension: condition B, shear: condition B; no supplemental splitting reinforcement present
	edge reinforcement: none or < No. 4 bar

Geometry [in.] & Loading [lb, in.lb]



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PROFIS Anchor (c) 2003-2009 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Company: Waterman Industries
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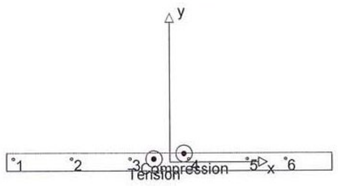
E-Mail: amanuel.wubneh@watermanusa.com

2 Load case/Resulting anchor forces

Load case: Design loads



Anchor reactions [lb]
Tension force: (+Tension, -Compression)

Anchor	Tension force	Shear force	Shear force x	Shear force y
1	6035	667	667	-8
2	5956	667	667	-5
3	5877	667	667	-1
4	5797	667	667	2
5	5718	667	667	5
6	5667	667	667	7

max. concrete compressive strain: 0.19 [‰]
max. concrete compressive stress: 838 [psi]
resulting tension force in (x/y)=(-5.383/1.000): 35050 [lb]
resulting compression force in (x/y)=(4.906/2.851): 18202 [lb]

3 Tension load

	Load N_{ua} [lb]	Capacity ϕN_n [lb]	Utilization $\beta_N = N_{ua}/\phi N_n$	Status
Steel Strength*	6035	18479	33	OK
Bond Strength**	35050	77651	46	OK
Sustained Tension Load Bond Strength*	N/A	N/A	N/A	N/A
Concrete Breakout Strength**	35050	47970	74	OK

* anchor having the highest loading **anchor group (anchors in tension)

3.1 Steel Strength

N_{sa} = ESR value refer to ICC-ES ESR-3814
$\phi N_{sa} \geq N_{ua}$ ACI 318-11 Table D.4.1.1

Variables

$A_{se,N}$ [in.^{2}]	f_{uta} [psi]
0.33	85000

Calculations

N_{sa} [lb]
28430

Results

N_{sa} [lb]	ϕ_{steel}	ϕN_{sa} [lb]	N_{ua} [lb]
28430	0.650	18479	6035

The load factors per code are not shown. However, the utilization column shows enough capacity & results in a sufficient factor of safety.

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E-Mail: amanuel.wubneh@watermanusa.com

3.2 Bond Strength

$N_{ag} = \left(\frac{A_{Na}}{A_{Na0}}\right) \Psi_{ec1,Na} \Psi_{ec2,Na} \Psi_{ed,Na} \Psi_{cp,Na} N_{ba}$ ACI 318-11 Eq. (D-19)

$\phi N_{ag} \geq N_{ua}$ ACI 318-11 Table D.4.1.1

A_{Na} = see ACI 318-11, Part D.5.5.1, Fig. RD.5.5.1(b)

$A_{Na0} = (2 c_{Na})^2$ ACI 318-11 Eq. (D-20)

$c_{Na} = 10 d_a \sqrt{\frac{\tau_{uncr}}{1100}}$ ACI 318-11 Eq. (D-21)

$\Psi_{ec,Na} = \left(\frac{1}{1 + \frac{e_N}{c_{Na}}}\right) \leq 1.0$ ACI 318-11 Eq. (D-23)

$\Psi_{ed,Na} = 0.7 + 0.3 \left(\frac{c_{a,min}}{c_{Na}}\right) \leq 1.0$ ACI 318-11 Eq. (D-25)

$\Psi_{cp,Na} = MAX\left(\frac{c_{a,min}}{c_{ac}}; \frac{c_{Na}}{c_{ac}}\right) \leq 1.0$ ACI 318-11 Eq. (D-27)

$N_{ba} = \lambda_a \cdot \tau_{k,c} \cdot \pi \cdot d_a \cdot h_{ef}$ ACI 318-11 Eq. (D-22)

Variables

$\tau_{k,c,uncr}$ [psi]	d_a [in.]	h_{ef} [in.]	$c_{a,min}$ [in.]	$\tau_{k,c}$ [psi]
2317	0.750	14.000	4.000	1315

$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	c_{ac} [in.]	λ_a
0.717	0.000	34.701	1.000

Calculations

c_{Na} [in.]	A_{Na} [in.^{2}]	A_{Na0} [in.^{2}]	$\Psi_{ed,Na}$
10.836	1701.23	469.65	0.811

$\Psi_{ec1,Na}$	$\Psi_{ec2,Na}$	$\Psi_{cp,Na}$	N_{ba} [lb]
0.938	1.000	1.000	43368

Results

N_{ag} [lb]	ϕ_{bond}	ϕN_{ag} [lb]	N_{ua} [lb]
119463	0.650	77651	35050

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E-Mail: amanuel.wubneh@watermanusa.com

3.3 Concrete Breakout Strength

$N_{cbg} = \left(\frac{A_{Nc}}{A_{Nc0}}\right) \Psi_{ec,N} \Psi_{ed,N} \Psi_{c,N} \Psi_{cp,N} N_b$ — ACI 318-11 Eq. (D-4)

$\phi N_{cbg} \geq N_{ua}$ — ACI 318-11 Table D.4.1.1

A_{Nc} see ACI 318-11, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ — ACI 318-11 Eq. (D-5)

$\Psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e_N}{3 h_{ef}}}\right) \leq 1.0$ — ACI 318-11 Eq. (D-8)

$\Psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}}\right) \leq 1.0$ — ACI 318-11 Eq. (D-10)

$\Psi_{cp,N} = MAX\left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}}\right) \leq 1.0$ — ACI 318-11 Eq. (D-12)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ — ACI 318-11 Eq. (D-6)

Variables

h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]	$\Psi_{c,N}$
14.000	0.717	0.000	4.000	1.000

c_{ac} [in.]	k_c	λ_a	f'_c [psi]
34.701	17	1.000	3500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\Psi_{ec1,N}$	$\Psi_{ec2,N}$	$\Psi_{ed,N}$	$\Psi_{cp,N}$	N_b [lb]
3375.00	1764.00	0.967	1.000	0.757	1.000	52684

Results

N_{cbg} [lb]	$\phi_{concrete}$	ϕN_{cbg} [lb]	N_{ua} [lb]
73800	0.650	47970	35050

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4 Shear load

	Load V_{ua} [lb]	Capacity ϕV_n [lb]	Utilization $\beta_V = V_{ua}/\phi V_n$	Status
Steel Strength*	667	8189	9	OK
Steel failure (with lever arm)*	667	1199	56	OK
Pryout Strength (Concrete Breakout Strength controls)*	667	14906	5	OK
Concrete edge failure in direction y-**	4000	17511	23	OK

* anchor having the highest loading **anchor group (relevant anchors)

4.1 Steel Strength

V_{sa} = ESR value refer to ICC-ES ESR-3814
$\phi V_{steel} \geq V_{ua}$ ACI 318-11 Table D.4.1.1

Variables

$A_{se,V}$ [in.^{2}]	f_{uta} [psi]
0.33	85000

Calculations

V_{sa} [lb]
17060

Results

V_{sa} [lb]	ϕ_{steel}	ϕ_{eb}	ϕV_{sa} [lb]	V_{ua} [lb]
17060	0.600	0.800	8189	667

4.2 Steel failure (with lever arm)

$V_s^M = \frac{\alpha_M \cdot M_s}{L_b}$ bending equation for stand-off
$M_s = M_s^0 \left(1 - \frac{N_{ua}}{\phi N_{sa}}\right)$ resultant flexural resistance of anchor
$M_s^0 = (1.2)\ (S)\ (f_{u,min})$ characteristic flexural resistance of anchor
$\left(1 - \frac{N_{ua}}{\phi N_{sa}}\right)$ reduction for tensile force acting simultaneously with a shear force on the anchor
$S = \frac{\pi(d)^3}{32}$ elastic section modulus of anchor bolt at concrete surface
$L_b = z + (n)(d_0)$ internal lever arm adjusted for spalling of the surface concrete
$\phi V_s^M \geq V_{ua}$ ACI 318-11 Table D.4.1.1

Variables

α_M	$f_{u,min}$ [psi]	N_{ua} [lb]	ϕN_{sa} [lb]	z [in.]	n	d_0 [in.]
2.00	85000	6035	18479	1.500	0.500	0.750

Calculations

M_s^0 [in.lb]	$\left(1 - \frac{N_{ua}}{\phi N_{sa}}\right)$	M_s [in.lb]	L_b [in.]
2783.038	0.673	1874.140	1.875

Results

V_s^M [lb]	ϕ_{steel}	ϕV_s^M [lb]	V_{ua} [lb]
1999	0.600	1199	667

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E-Mail:	amanuel.wubneh@watermanusa.com		

4.3 Pryout Strength (Concrete Breakout Strength controls)

$V_{cp} = k_{cp} \left[\left(\frac{A_{Nc}}{A_{Nc0}} \right) \psi_{ed,N} \psi_{c,N} \psi_{cp,N} N_b \right]$ ACI 318-11 Eq. (D-40)

$\phi V_{cp} \geq V_{ua}$ ACI 318-11 Table D.4.1.1

A_{Nc} see ACI 318-11, Part D.5.2.1, Fig. RD.5.2.1(b)

$A_{Nc0} = 9 h_{ef}^2$ ACI 318-11 Eq. (D-5)

$\psi_{ec,N} = \left(\frac{1}{1 + \frac{2 e'_N}{3 h_{ef}}} \right) \leq 1.0$ ACI 318-11 Eq. (D-8)

$\psi_{ed,N} = 0.7 + 0.3 \left(\frac{c_{a,min}}{1.5 h_{ef}} \right) \leq 1.0$ ACI 318-11 Eq. (D-10)

$\psi_{cp,N} = MAX \left(\frac{c_{a,min}}{c_{ac}}, \frac{1.5 h_{ef}}{c_{ac}} \right) \leq 1.0$ ACI 318-11 Eq. (D-12)

$N_b = k_c \lambda_a \sqrt{f'_c} h_{ef}^{1.5}$ ACI 318-11 Eq. (D-6)

Variables

k_{cp}	h_{ef} [in.]	$e_{c1,N}$ [in.]	$e_{c2,N}$ [in.]	$c_{a,min}$ [in.]
2	14.000	0.000	0.000	4.000

$\psi_{c,N}$	c_{ac} [in.]	k_c	λ_a	f'_c [psi]
1.000	34.701	17	1.000	3500

Calculations

A_{Nc} [in.^{2}]	A_{Nc0} [in.^{2}]	$\psi_{ec1,N}$	$\psi_{ec2,N}$	$\psi_{ed,N}$	$\psi_{cp,N}$	N_b [lb]
470.83	1764.00	1.000	1.000	0.757	1.000	52684

Results

V_{cp} [lb]	$\phi_{concrete}$	ϕV_{cp} [lb]	V_{ua} [lb]
21294	0.700	14906	667

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4.4 Concrete edge failure in direction y-

$V_{cbg} = \left(\frac{A_{Vc}}{A_{Vc0}}\right) \Psi_{ec,V} \Psi_{ed,V} \Psi_{c,V} \Psi_{h,V} \Psi_{parallel,V} V_b$ ACI 318-11 Eq. (D-31)

$\phi V_{cbg} \geq V_{ua}$ ACI 318-11 Table D.4.1.1

A_{Vc} see ACI 318-11, Part D.6.2.1, Fig. RD.6.2.1(b)

$A_{Vc0} = 4.5 c_{a1}^2$ ACI 318-11 Eq. (D-32)

$\Psi_{ec,V} = \left(\frac{1}{1 + \frac{2e'_v}{3c_{a1}}}\right) \leq 1.0$ ACI 318-11 Eq. (D-36)

$\Psi_{ed,V} = 0.7 + 0.3\left(\frac{c_{a2}}{1.5c_{a1}}\right) \leq 1.0$ ACI 318-11 Eq. (D-38)

$\Psi_{h,V} = \sqrt{\frac{1.5c_{a1}}{h_a}} \geq 1.0$ ACI 318-11 Eq. (D-39)

$V_b = 9 \lambda_a \sqrt{f'_c} c_{a1}^{1.5}$ ACI 318-11 Eq. (D-34)

Variables

c_{a1} [in.]	c_{a2} [in.]	e_{cV} [in.]	$\Psi_{c,V}$	h_a [in.]
4.000	-	0.130	1.000	24.000

l_e [in.]	λ_a	d_a [in.]	f'_c [psi]	$\Psi_{parallel,V}$
6.000	1.000	0.750	3500	1.000

Calculations

A_{Vc} [in.^{2}]	A_{Vc0} [in.^{2}]	$\Psi_{ec,V}$	$\Psi_{ed,V}$	$\Psi_{h,V}$	V_b [lb]
432.00	72.00	0.979	1.000	1.000	4260

Results

V_{cbg} [lb]	$\phi_{concrete}$	ϕV_{cbg} [lb]	V_{ua} [lb]
25016	0.700	17511	4000

5 Combined tension and shear loads

β_N	β_V	ζ	Utilization $\beta_{N,V}$ [%]	Status
0.731	0.556	5/3	97	OK

$\beta_{NV} = \beta_N^{\zeta} + \beta_V^{\zeta} <= 1$

6 Warnings

- The anchor design methods in PROFIS Anchor require rigid anchor plates per current regulations (ETAG 001/Annex C, EOTA TR029, etc.). This means load re-distribution on the anchors due to elastic deformations of the anchor plate are not considered - the anchor plate is assumed to be sufficiently stiff, in order not to be deformed when subjected to the design loading. PROFIS Anchor calculates the minimum required anchor plate thickness with FEM to limit the stress of the anchor plate based on the assumptions explained above. The proof if the rigid base plate assumption is valid is not carried out by PROFIS Anchor. Input data and results must be checked for agreement with the existing conditions and for plausibility!
- Condition A applies when supplementary reinforcement is used. The Φ factor is increased for non-steel Design Strengths except Pullout Strength and Pryout strength. Condition B applies when supplementary reinforcement is not used and for Pullout Strength and Pryout Strength. Refer to your local standard.
- ACI 318 does not specifically address anchor bending when a stand-off condition exists. PROFIS Anchor calculates a shear load corresponding to anchor bending when stand-off exists and includes the results as a shear Design Strength!
- Design Strengths of adhesive anchor systems are influenced by the cleaning method. Refer to the INSTRUCTIONS FOR USE given in the Evaluation Service Report for cleaning and installation instructions
- Checking the transfer of loads into the base material and the shear resistance are required in accordance with ACI 318 or the relevant standard!
- Installation of Hilti adhesive anchor systems shall be performed by personnel trained to install Hilti adhesive anchors. Reference ACI 318-11, Part D.9.1

Approved AsNoted
BY: Ken Upmal
DATE: 11/29/2017
RESUBMIT: NO
RECEIVED: November 13, 2017
CKD BY: DV/BK (Green Int'l.)
STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROFIS Anchor (c) 2003-2009 Hilti AG, FL-9494 Schaan Hilti is a registered Trademark of Hilti AG, Schaan

Company:	Waterman Industries	Page:	8
Specifier:	Amanuel Wubneh P.E.	Project:	Renaud Bros,Inc.
Address:	25500 Road 204	Sub-Project I Pos. No.:	RB-17-0351 Rev.1
Phone I Fax:	(800) 331-0808 | (559) 562-8629	Date:	11/7/2017
E-Mail:	amanuel.wubneh@watermanusa.com		

Fastening meets the design criteria!

Input data and results must be checked for agreement with the existing conditions and for plausibility!
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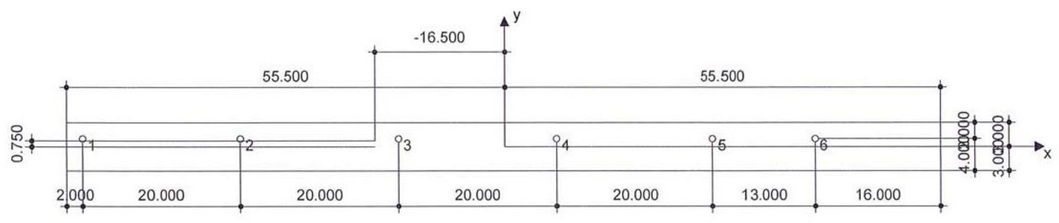
7 Installation data

Anchor plate, steel: -
Profile: no profile
Hole diameter in the fixture: d_f = 0.813 in.
Plate thickness (input): 1.000 in.
Recommended plate thickness: not calculated
Drilling method: Hammer drilled
Cleaning: Compressed air cleaning of the drilled hole according to instructions for use is required

Anchor type and diameter: HIT-RE 500 V3 + HAS-R 316 SS 3/4
Installation torque: 1200.000 in.lb
Hole diameter in the base material: 0.875 in.
Hole depth in the base material: 14.000 in.
Minimum thickness of the base material: 15.750 in.

7.1 Recommended accessories

Drilling	Cleaning	Setting
• Suitable Rotary Hammer • Properly sized drill bit	• Compressed air with required accessories to blow from the bottom of the hole • Proper diameter wire brush	• Dispenser including cassette and mixer • Torque wrench



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Coordinates Anchor in.

Anchor	x	y	c_{-x}	c_{+x}	c_{-y}	c_{+y}
1	-53.500	1.000	-	-	4.000	-
2	-33.500	1.000	-	-	4.000	-
3	-13.500	1.000	-	-	4.000	-
4	6.500	1.000	-	-	4.000	-
5	26.500	1.000	-	-	4.000	-
6	39.500	1.000	-	-	4.000	-

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8 Remarks; Your Cooperation Duties

- Any and all information and data contained in the Software concern solely the use of Hilti products and are based on the principles, formulas and security regulations in accordance with Hilti's technical directions and operating, mounting and assembly instructions, etc., that must be strictly complied with by the user. All figures contained therein are average figures, and therefore use-specific tests are to be conducted prior to using the relevant Hilti product. The results of the calculations carried out by means of the Software are based essentially on the data you put in. Therefore, you bear the sole responsibility for the absence of errors, the completeness and the relevance of the data to be put in by you. Moreover, you bear sole responsibility for having the results of the calculation checked and cleared by an expert, particularly with regard to compliance with applicable norms and permits, prior to using them for your specific facility. The Software serves only as an aid to interpret norms and permits without any guarantee as to the absence of errors, the correctness and the relevance of the results or suitability for a specific application.
- You must take all necessary and reasonable steps to prevent or limit damage caused by the Software. In particular, you must arrange for the regular backup of programs and data and, if applicable, carry out the updates of the Software offered by Hilti on a regular basis. If you do not use the AutoUpdate function of the Software, you must ensure that you are using the current and thus up-to-date version of the Software in each case by carrying out manual updates via the Hilti Website. Hilti will not be liable for consequences, such as the recovery of lost or damaged data or programs, arising from a culpable breach of duty by you.

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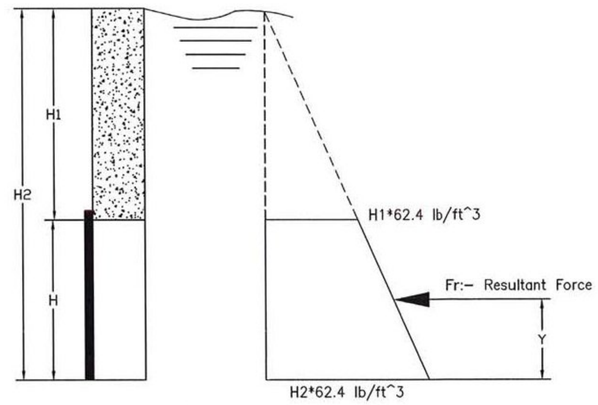
Waterman
25500 Road 204 ,Exeter, Ca. 93221
Phone: (303) 288-7873 * Fax: (303) 287-8531
www.WatermanUSA.com

Desc.	RB-17-0487 Hydrostatic Load calc		
		Order No.	M028960C
Calculated by	Amanuel Wubneh P.E.	Date	9/21/2017
Checked by	REM	DWG	RB-17-0487
Revision.	1	Tag#	STP SCRP(4)



Design Parameters

Density of Water,ϒ = 62.4 lb/ft^3
Height of the gate Opening = 72 in
Measurement from max. water level to top of opening, H1= 144 in
Hydraulic Head to the invert, H2= 216.00 in
Width Of the Gate, W= 72 in
Hydraulic Head to the center of opening , Hc= 180 in= 15 ft

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Applied Load

Hydrostatic Load, $F := 62.4 \cdot \left(\frac{W}{12}\right) \cdot \left(\frac{H}{12}\right) \cdot Hc =$ 33696 lbs

Hydrostatic load per side of the gate ,F/2= 16848 lbs
Moment created due to eccentrical loading , Me= 29484 lb.in
Point of application of the resultant force , Y= $\frac{[(H_1 * H/2 + 1/2 * (H_2 - H_1) * H/3)]}{(H_2 + H_1) * 0.5}$

Y= 33.6 in

STATE OF VERMONT
AMANUEL M. WUBNEH
018.0133326
CIVIL
LICENSED PROFESSIONAL ENGINEER

11-7-2017

LIFT & STEM CALCULATIONS

CONTRACTOR'S NAME: RENAUD BROS., INC.
JOB SITE: Peru, Vermont
QUOTE #: WQ17-H-28960C
JOB #: M028960
ITEM #: 0
REVISION #: 0
DATE: 8/22/2017
BY: AMW

GATE IDENTIFICATION: RB-17-0487
GATE DESCRIPTION: 72 x 72 S-5000 ; GATE WEIGHT: 3611 LBS
MAXIMUM OPERATING HEADS: SEATING = 15 FT; UNSEATING = 15 FT
DIFFERENTIAL = 15 FT
SOURCE OF OPERATING HEADS: ESTIMATED
STEM DIAMETER: 2.500 IN; THREADED: 2.5 DIA. ; 1/4 PITCH ; 1/4 LEAD; LEFT HAND; STUB ACME
STEM LENGTH: 135.00 IN; STEM WEIGHT: 188 LBS

LIFTING FORCE CALCULATIONS & OPERATING SPECIFICATIONS

REQUIRED OPERATING FORCE: $Fo = W \cdot A \cdot H \cdot fo + Wg + Ws$

$Fo = 62.4 \frac{LBS}{FT^3} \cdot 36.00\ FT^2 \cdot 15.00\ FT \cdot 0.35 + 3611\ LBS + 188\ LBS = 15,593\ LBS$

LIFT USED: 3R7/AS3-12:1

RATED LIFT CAPACITY: 24,545 LBS @ 40 LBS INPUT ON 15" HAND CRANK

STEM CAPACITY CALCULATIONS

CALCULATED FROM EULERS EQUATION, $Pc = \frac{2\pi^2 EA}{\left(L/r\right)^2}$

SOLID PORTION:
DIA.= 2.500 IN; AREA= 4.91 IN^2; $LG_{max.}$ = 125.00; L/r = 200.00 ; Pc= 66,861 LBS

THREADED PORTION:
DIA.= 2.359 IN; AREA= 4.37 IN^2; $LG_{max.}$ = 117.95; L/r = 200.00 ; Pc= 59,520 LBS

SAFETY FACTOR : $Sf = \frac{Pc_{MIN}}{Lc} = \frac{59,520\ LBS}{24,545\ LBS} = 2.43$

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TENSILE STRENGTH$_{min}$: $TS = \frac{F_u * A}{\Omega} = \frac{70{,}000\ psi * \pi(\frac{D_{2min} + D_{1max}}{4})^2}{5.00}$

(REFER MACHINERY HANDBOOK 26 PAGE 1794)

TS = 58,801 LBS

SAFETY FACTOR : $Sf = \frac{58{,}801\ LBS}{24{,}545\ LBS}$ = 2.40 OK!

STEM THREAD SHEAR CAPACITY PER INCH :

$\frac{V_n}{\Omega} = \frac{F_v * \pi * D_{1max}(0.5 + n * \tan 14.5° * (D_{2min} - D_{1max}))}{1.50}$ = 44,483.22 LBS/IN

(REFER MACHINERY HANDBOOK 26 PAGE 1794)

LIFT NUT HEIGHT = 3.386 IN

TOTAL STEM THREAD SHEAR CAPACITY = $\frac{V_n}{\Omega}$ * LIFT NUT HEIGHT = 150,620 LBS

SAFETY FACTOR : $Sf = \frac{150{,}620\ LBS}{24{,}545\ LBS}$ = 6.14 OK!