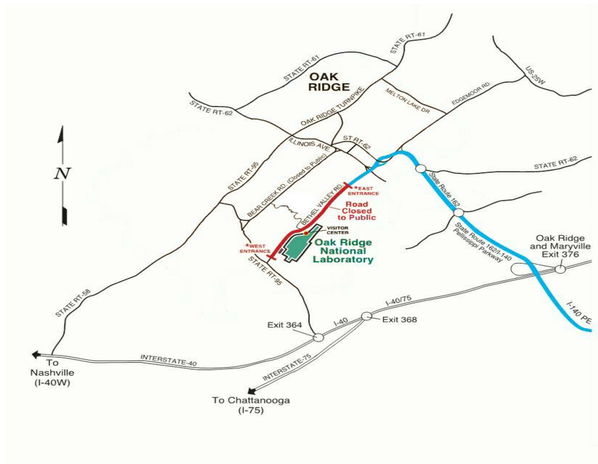
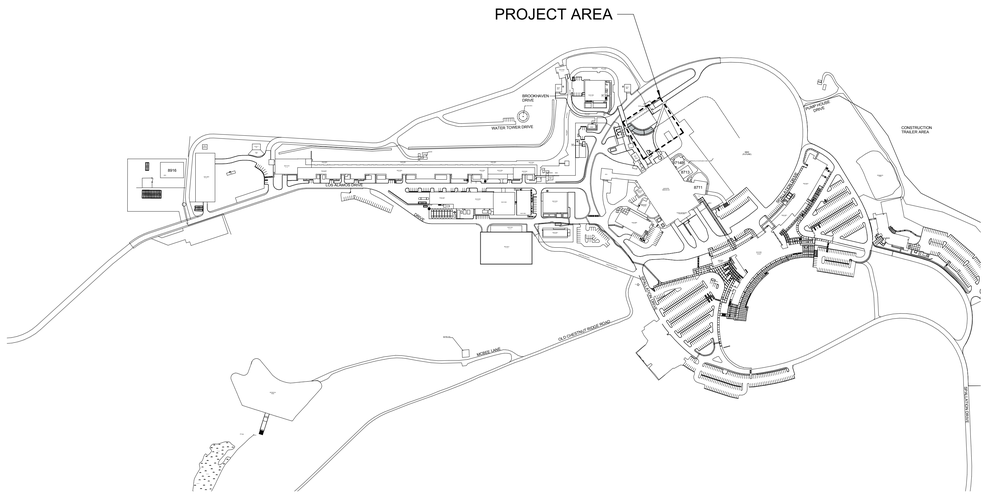
PPU- RTBT STUB PRELIMINARY AND FINAL DESIGN

SPALLATION NEUTRON SOURCE - OAK RIDGE NATIONAL LABORATORY
OAK RIDGE, TENNESSEE

Certified For Construction - 7/11/2019





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C1.31.01	ACCELERATOR TUNNEL BERM SHIELDING R8E8550E001	REV 0

Applicable Codes, Standards and Ordinances

- 2012 INTERNATIONAL BUILDING CODE
- 2012 INTERNATIONAL MECHANICAL CODE
- 2012 INTERNATIONAL PLUMBING CODE
- 2012 INTERNATIONAL FUEL GAS CODE
- 2012 INTERNATIONAL ENERGY CONSERVATION CODE
- 2012 INTERNATIONAL FIRE CODE
- NFPA 101 - LIFE SAFETY CODE, LATEST EDITION
- ICC/ANSI A117.1 - 1998 ACCESSIBLE USABLE BUILDINGS AND FACILITIES
- 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN.
- NFPA 1, FIRE CODE, LATEST EDITION.
- NFPA 10, PORTABLE FIRE EXTINGUISHERS
- NFPA 13, INSTALLATION OF SPRINKLER SYSTEMS, LATEST EDITION
- ASCE 7-10 – MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
- ACI 318-11 – BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
- AISC 360-10 – SPECIFICATION FOR STRUCTURAL STEEL BUILDING.
- DOE STD 1020-12 DOE-STD-1020-2012, NATURAL PHENOMENA HAZARD ANALYSIS AND DESIGN CRITERIA FOR DEPARTMENT OF ENERGY FACILITIES.
- NFPA 70, THE NATIONAL ELECTRICAL CODE, LATEST EDITION
- NFPA 72, NATIONAL FIRE ALARM AND SIGNALLING CODE, LATEST EDITION.
- NFPA 90A, STANDARD FOR THE INSTALLATION OF AIR-CONDITIONING AND VENTILATION SYSTEMS, LATEST EDITION.
- NFPA 110, STANDARD FOR EMERGENCY AND STANDBY POWER SYSTEMS, LATEST EDITION.
- NFPA 780, STANDARD FOR INSTALLATION OF LIGHTNING PROTECTION SYSTEMS, LATEST EDITION.

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM
ENGINEERING PROCEDURE

NOT FOR CONSTRUCTION

REV	CHANGE ITEM	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
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REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE
CURT DOUGLAS FINLEY
REGISTERED ARCHITECT
STATE OF TENNESSEE
No. 10591

DSN	M. MICHILINI
DRW	A. BELTRAN
CHK	J. HOWARD
DEPT	
PE	
PJ	MARK CONNELL
REQ	TBD
UTB	

REV. DATE — DRAWING APPROVALS

A/E DRAWING NUMBER
G0000

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Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725
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PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

COVER SHEET

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
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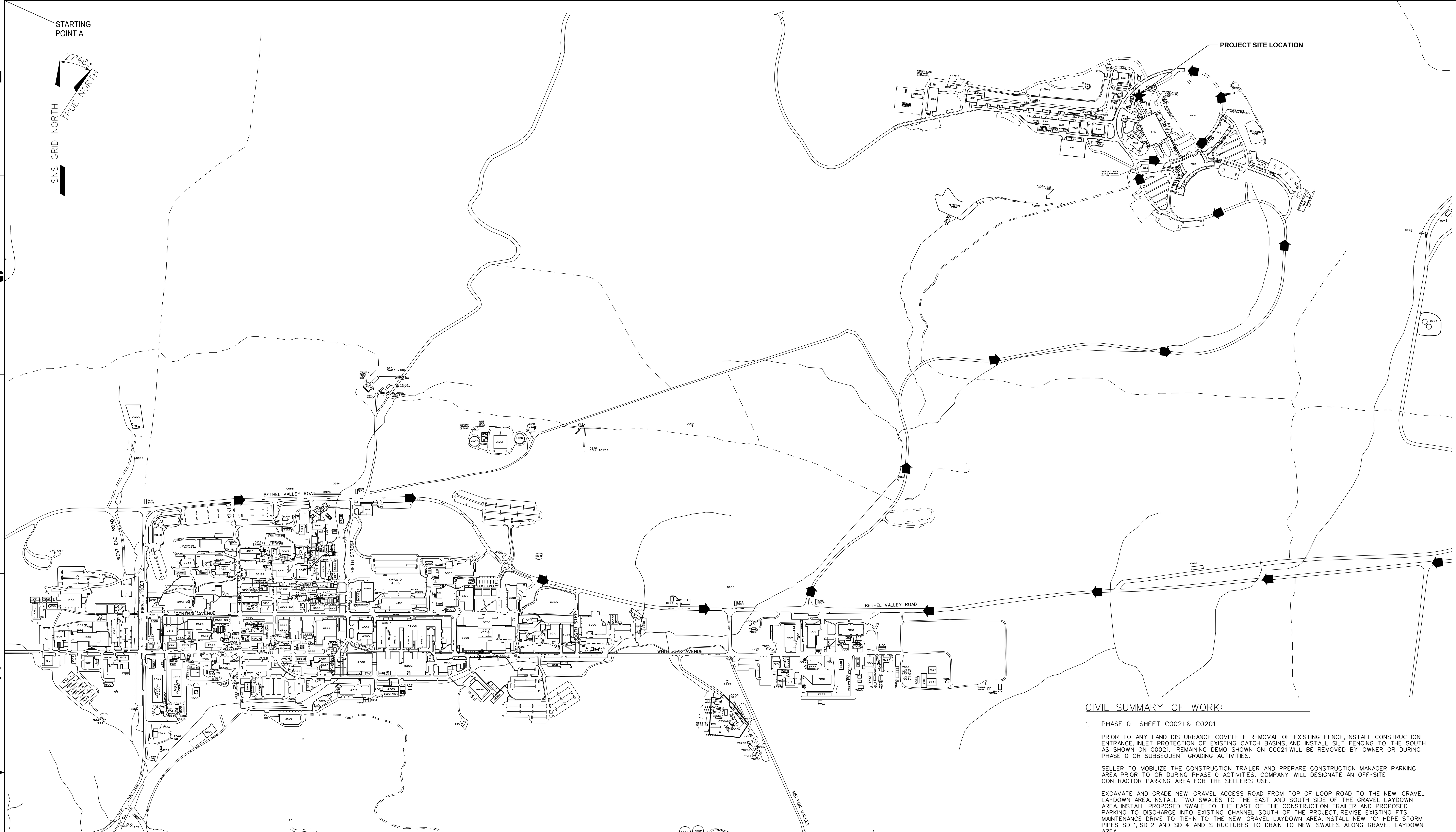
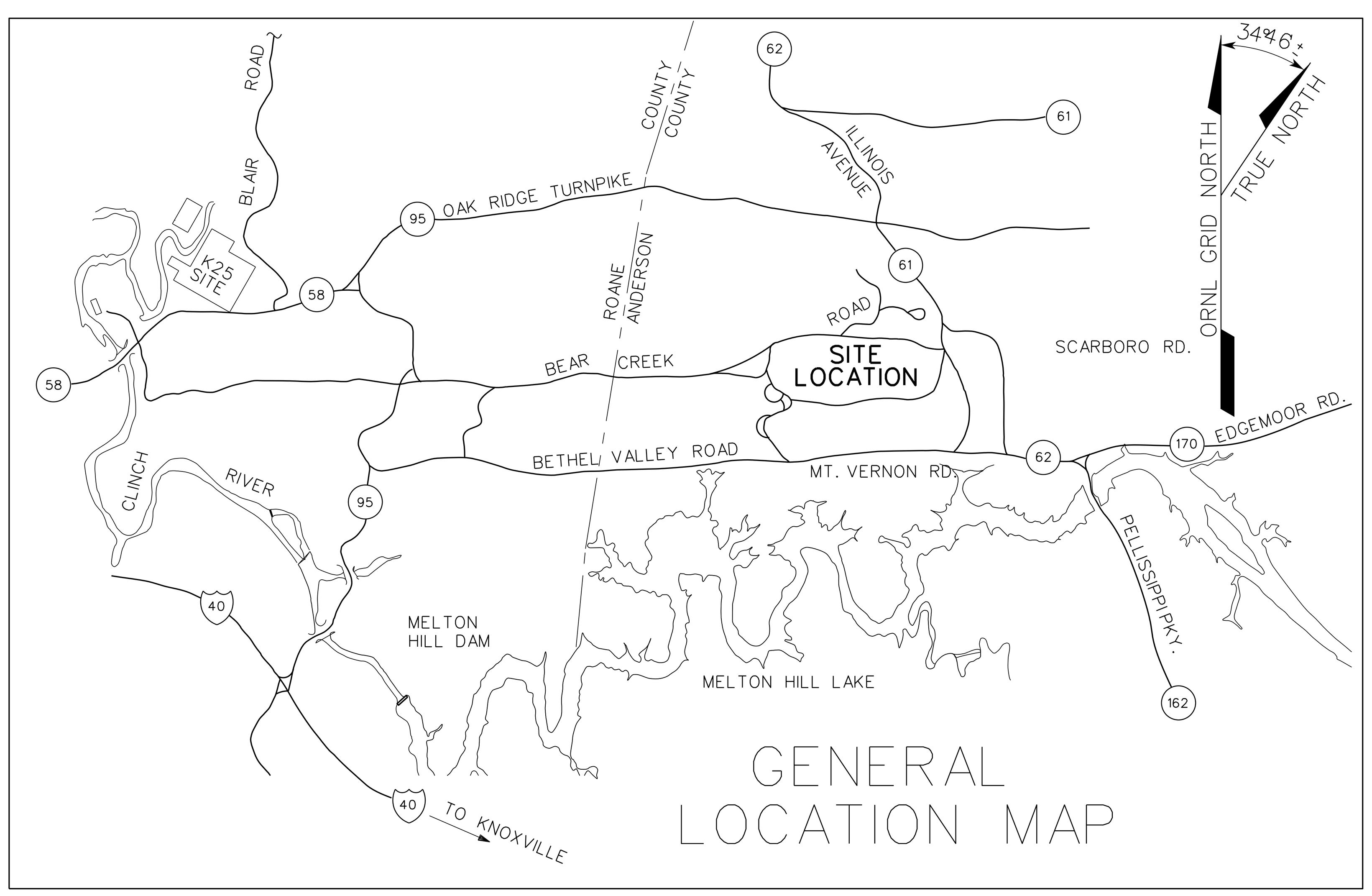


SITE ACCESS PLAN



GENERAL LOCATION MAP

CIVIL SUMMARY OF WORK:

1. PHASE 0 SHEET C0021 & C0201

   PRIOR TO ANY LAND DISTURBANCE COMPLETE REMOVAL OF EXISTING FENCE, INSTALL CONSTRUCTION ENTRANCE, INLET PROTECTION OF EXISTING CATCH BASINS, AND INSTALL SILT FENCING TO THE SOUTH AS SHOWN ON C0021. REMAINING DEMO SHOWN ON C0021 WILL BE REMOVED BY OWNER OR DURING PHASE 0 OR SUBSEQUENT GRADING ACTIVITIES.

   SELLER TO MOBILIZE THE CONSTRUCTION TRAILER AND PREPARE CONSTRUCTION MANAGER PARKING AREA PRIOR TO OR DURING PHASE 0 ACTIVITIES. COMPANY WILL DESIGNATE AN OFF-SITE CONTRACTOR PARKING AREA FOR THE SELLER'S USE.

   EXCAVATE AND GRADE NEW GRAVEL ACCESS ROAD FROM TOP OF LOOP ROAD TO THE NEW GRAVEL LAYDOWN AREA. INSTALL TWO SWALES TO THE EAST AND SOUTH SIDE OF THE GRAVEL LAYDOWN AREA. INSTALL PROPOSED SWALE TO THE EAST OF THE CONSTRUCTION TRAILER AND PROPOSED PARKING TO DISCHARGE INTO EXISTING CHANNEL SOUTH OF THE PROJECT. REVISE EXISTING FTS MAINTENANCE DRIVE TO TIE-IN TO THE NEW GRAVEL LAYDOWN AREA. INSTALL NEW 10" HDPE STORM PIPES SD-1, SD-2 AND SD-4 AND STRUCTURES TO DRAIN TO NEW SWALES ALONG GRAVEL LAYDOWN AREA.

   INSTALL SLOPE MATTING WITH SEEDING ON ALL 3:1 SLOPES, INLET PROTECTION ON ALL EXISTING AND PROPOSED STORM INLETS WITHIN LIMITS OF CONSTRUCTION, OUTLET PROTECTION AT HEADWALLS IN SWALES, FILTER RING AROUND STORM INLET IN SWALE, CONCRETE WASHOUT AT TOP OF GRAVEL ROAD AND SILT FENCE AS SHOWN ON PLANS.

2. PHASE 1 SHEET C0021 & C0202

   EXCAVATE AND GRADE NEW 0.10-ACRE GRAVEL LAYDOWN AREA OVER EXISTING TUNNEL ACCESS. EXCAVATE AND GRADE BACK SLOPES AT 1.5:1 IN STUB AREA TO NEW ELEVATION 1082.75. REMOVE EXISTING TUNNEL LINER TO THE LIMITS SHOWN ON DRAWING C0401. THE SELLER SHALL FIELD LOCATE EXISTING BELOW GRADE STRUCTURES BY METHOD OF POT HOLING. SELLER SHALL CAREFULLY EXCAVATE BY HAND OR SOME OTHER MEANS TO PROTECT EXISTING BELOW GRADE STRUCTURES DURING EXCAVATION.

   INSTALL NEW FRENCH DRAINS (FR-1 AND FR-2) AT BOTTOM OF SLOPE IN STUB AREA. INSTALL NEW 10" HDPE STORM PIPE SD-3 AND STRUCTURE AD-3 AND CONNECT TO EXISTING AREA INLET AD-1. FINE GRADE PROJECT AREA FOR POSITIVE DRAINAGE TO INSTALLED STORM DRAIN STRUCTURES AND SWALES.

   COVER SLOPES WITH SHOTCRETE FOR EROSION PROTECTION AS SHOWN ON PLANS. RE-INSTALL OR INSTALL SLOPE MATTING AS REQUIRED, INSTALL INLET PROTECTION ON AD-1.

3. PHASE 2 SHEET C0203

   SELLER WILL BE REQUIRED TO SUBMIT PE-CERTIFIED PLANS FOR PROPOSED SHEET PILING TO THE COMPANY FOR APPROVAL PRIOR TO PROCEEDING WITH PHASE 2.

   SELLER SHALL INSTALL SHEET PILING AND THEN EXCAVATE STUB AREA.

   SELLER MAY CHOOSE TO INSTALL STONE BASE IN INTERVALS TO ALIGN WITH TUNNEL CONSTRUCTION AND TO PROTECT THE SUBGRADE SOILS FROM PROLONGED EXPOSURE TO THE ELEMENTS. ALTHOUGH THE COMPLETE CONSTRUCTION FOUNDATION DRAINAGE SYSTEM (FDN-1 AND FDN-2) SHALL BE INSTALLED AT THE BEGINNING OF PHASE 2 TO PROVIDE FOR DRAINAGE DISCHARGE. TIE THE FOUNDATION DRAINAGE SYSTEM TO EXISTING AREA DRAIN AD-4.

   MAINTAIN EXISTING EROSION CONTROL.

4. PHASE 3- SHEET C0204

   CONTRACTOR SHALL INSTALL NEW FOUNDATION DRAINS (FDN-2 AND FDN-3) AT THE COMPLETION OF STUB CONSTRUCTION AND PRIOR TO BACKFILLING. THESE NEW FOUNDATION DRAINS WILL BE TIED TO AD-4.

   REMOVE EXISTING FRENCH DRAINS FR-1 AND FR-2, AREA INLET AD-3 AND STORM PIPE SD-3.

   BACKFILL ADJACENT TO NEW TUNNEL AS SHOWN ON THE PLANS. CONTINUE FILL OPERATIONS TO THE ELEVATION OF THE PROPOSED LINER. INSTALL NEW EMBANKMENT LINER AND FINE GRADE THE BACKFILL SLOPES AS SHOWN ON PLANS.

   MAINTAIN EXISTING EROSION CONTROL AND STABILIZE ALL NEWLY GRADED SLOPES IN ACCORDANCE WITH PROJECT PLANS AND SPECIFICATIONS.

GENERAL NOTES:

1. NOTHING IN THE GENERAL NOTES OR SPECIAL PROVISIONS SHALL RELIEVE THE SELLER FROM HIS RESPONSIBILITIES TOWARD THE SAFETY AND CONVENIENCE OF THE GENERAL PUBLIC.
2. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH ORNL REQUIREMENTS.
3. ALL DIMENSIONS SHOWN ARE TO FACE OF CONCRETE UNLESS OTHERWISE NOTED. ALL ANGLES ARE 90° UNLESS OTHERWISE NOTED.
4. ANY CHANGE IN THE APPROVED PLANS SHALL BE APPROVED BY THE COMPANY PRIOR TO THE FIELD CHANGES.
5. IN THE EVENT OF ANY DISCREPANCIES AN/OR ERRORS FOUND IN THE DRAWINGS, OR IF PROBLEMS ARE ENCOUNTERED DURING CONSTRUCTION, THE SELLER SHALL BE REQUIRED TO NOTIFY THE COMPANY BEFORE PROCEEDING WITH THE WORK. IF COMPANY IS NOT NOTIFIED, THE CONTRACTOR SHALL TAKE RESPONSIBILITY FOR THE COST OF ANY REVISION.

GRADING

1. ANY AREA THAT IS DISTURBED OUTSIDE LIMITS OF CONSTRUCTION DURING THE LIFE OF THIS PROJECT SHALL BE REPAIRED BY THE SELLER AT HIS EXPENSE. HOWEVER, DAMAGE DONE TO STREAM CHANNELS, INCLUDING DRY STREAM CHANNELS, MAY NOT BE REPAIRED WITHOUT THE PROPER ENVIRONMENTAL PERMITS. THIS INCLUDES THE REMOVAL OF ACCUMULATED SEDIMENT FROM STREAM CHANNELS.
2. THE SELLER SHALL NOT DISPOSE OF ANY MATERIAL IN A REGULATORY FLOOD WAY AS DEFINED BY THE FEDERAL EMERGENCY MANAGEMENT AGENCY OR ANY OTHER FLOODWAY WITHOUT APPROVAL BY SAME. ALL MATERIAL SHALL BE DISPOSED OF IN UPLAND (NON-WETLAND) AREAS AND ABOVE ORDINARY HIGH WATER OF ANY ADJACENT WATERCOURSE. THIS DOES NOT ELIMINATE THE NEED TO OBTAIN ANY OTHER LICENSES OR PERMITS THAT MAY BE REQUIRED BY ANY OTHER FEDERAL, STATE OR LOCAL AGENCY. UNDER NO CIRCUMSTANCES SHALL EQUIPMENT BE OPERATED IN STREAM CHANNELS, INCLUDING DRY STREAM CHANNELS, WITHOUT FIRST OBTAINING THE PROPER REGULATORY PERMITS.
3. CONSTRUCTION WORK SHALL BE STAKED OUT USING HORIZONTAL AND VERTICAL CONTROL PROVIDED ON DRAWINGS. THE SELLER SHALL VERIFY CONTROL PRIOR TO STARTING CONSTRUCTION. ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE COMPANY. THE COMPANY WILL NOT BE RESPONSIBLE FOR CONTROLS ESTABLISHED BY THE SELLER.
4. THE PROPOSED CONTOURS SHOWN ON THE PLANS REPRESENT FINISH GRADE ELEVATION AT THE COMPLETION OF THE PHASES. ADDITIONAL EARTHWORK MAY BE REQUIRED FOR STUB INSTALLATION AND SHALL BE INSTALLED IN SELLER'S SCOPE.
5. ALL NEWLY GRADED EARTHEN AREAS THAT ARE NOT TO BE PAVED OR LEFT AS STONE, SHALL BE TOP SOILED AND SEEDED BY THE SELLER.
6. ONLY EXCAVATED MATERIAL MEETING THE REQUIREMENTS FOR FILL MAY BE REUSED WITHIN THE LIMITS OF CONSTRUCTION FOR BACKFILL.
7. TOPSOIL SHALL BE STOCKPILED IN AREAS SHOWN OR IN AREAS APPROVED BY THE COMPANY.
8. ALL AVAILABLE PRECAUTIONS SHALL BE TAKEN TO CONTROL DUST. WHEN THE COMPANY OR SELLER JUDGES DUST TO BE A PROBLEM, THE SELLER SHALL CONTROL THE DUST BY SPRINKLING OR BY OTHER COMPANY APPROVED METHODS.

LANDSCAPE AND SEEDING

1. SEED AND TOPSOIL ALL DISTURBED AREAS.
2. FINISH GRADE IN ACCORDANCE WITH SPECIFICATION 31 22 19 AND SEED IN ACCORDANCE WITH SPECIFICATION 32 92 19.
3. GRADE STOCKPILE DURING CONSTRUCTION TO DRAIN. AT COMPLETION OF CONSTRUCTION REMAINING STOCKPILE SHALL BE FINISH GRADED TO DRAIN AND SEED WITH MULCH TO ESTABLISH VEGETATION.

EROSION CONTROL

1. SEDIMENT AND SOIL EROSION MEASURES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION ACTIVITIES TAKING PLACE, EXCEPT THOSE CONSTRUCTION ACTIVITIES NECESSARY TO INSTALL SUCH MEASURES, AND SHALL BE FULLY OPERATIONAL DURING CONSTRUCTION.
2. EROSION CONTROL DEVICES SHALL BE MAINTAINED DURING ALL PHASES OFCONSTRUCTION.
3. BACKFILL AND STABILIZE TRENCHES AND PITS PROMPTLY.
4. DO NOT DESTROY, REMOVE, OR DISTURB VEGETATIVE GROUND COVER MORE THAN 20 CALENDAR DAYS BEFORE GRADING OR EARTH MOVING.
5. ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE WITH ORNL REQUIREMENTS.
6. NO TREES ARE TO BE REMOVED AND/OR VEGETATION DISTURBED EXCEPT AS NECESSARY FOR GRADING PURPOSES.
7. AS SOON AS POSSIBLE AFTER GRADING IS COMPLETED. ALL GRADED AREAS INCLUDING SLOPES ARE TO BE MULCHED AND SEEDED.
8. WHEN THE TEMPORARY SOIL EROSION AND WATER POLLUTION CONTROL DEVICES ARE NO LONGER REQUIRED FOR THE INTENDED PURPOSE, IN THE OPINION OF THE COMPANY, THEY SHALL BE REMOVED.
9. TO INSURE EROSION CONTROL STRUCTURES WORK PROPERLY, IT IS IMPERATIVE THE SEDIMENT BE REMOVED, THEREFORE, "INSPECTION" AND "MAINTENANCE" OF STRUCTURES IS TO BE PERFORMED ON A REGULAR BASIS. SEE SPECIFICATION SECTION 31 25 00 FOR MINIMUM REQUIREMENTS.
10. DURING SEDIMENT REMOVAL, THE SELLER SHALL TAKE CARE TO INSURE THAT STRUCTURAL COMPONENTS OF EROSION CONTROL STRUCTURES ARE NOT DAMAGED AND THUS MADE INEFFECTIVE. IF DAMAGE DOES OCCUR, THE SELLER SHALL REPAIR THE STRUCTURES AT THE SELLER'S OWN EXPENSE.
11. STOCKPILED TOPSOIL OR FILL MATERIAL IS TO BE CONTROLLED SO THE SEDIMENT RUN-OFF WILL NOT CONTAMINATE SURROUNDING AREAS OR ENTER NEARBY STREAMS.
12. CLEARING AND GRUBBING IS TO BE HELD TO THE MINIMUM WIDTH NECESSARY TO ACCOMMODATE SLOPES. UNNECESSARY CANOPY REMOVAL (TREES, SHRUBS, ETC) IS PROHIBITED.
13. EROSION/SEDIMENTATION CONTROL MEASURES SHALL BE PLACED DOWNHILL FROM ALL GRADING OPERATIONS AND/OR AS SHOWN ON THE PLANS. THESE MEASURES SHALL CONSIST OF STRAW BALE AND SILT FENCES AS INDICATED ON THE PLANS.
14. EACH EROSION AND SEDIMENT CONTROL (E&SC) SHALL BE INSTALLED PRIOR TO INITIATION OF THE ACTIVITIES THAT THE CONTROL IS DESIGNED TO PROTECT. E&SCS MAY BE INSTALLED INCREMENTALLY, DEPENDING ON AREAS OF DISTURBANCE, UPON APPROVAL BY THE COMPANY. E&SCS MAY ALSO INCLUDE CONTROL OF STORM WATER RUN-ON FROM ADJACENT PROPERTIES.
15. E&SCS SHALL BE STRICTLY ENFORCED. ALL E&SCS ARE SUBJECT TO FIELD MODIFICATION AS DIRECTED BY THE COMPANY.
16. REFER TO SECTION 31 25 00-EROSION CONTROL FOR ADDITIONAL REQUIREMENTS.
17. E&SCS SHALL BE INSTALLED AND MAINTAINED UNDER THE SUPERVISION OF TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) LEVEL 1 EROSION PREVENTION AND SEDIMENT CONTROL CERTIFIED PERSONNEL. ALL INSPECTIONS OF E&SCS SHALL BE COMPLETED BY TDEC LEVEL 1 EROSION PREVENTION AND SEDIMENT CONTROL CERTIFIED PERSONNEL.
18. E&SCS SHALL BE INSPECTED AT LEAST ONCE A WEEK DURING OR IMMEDIATELY AFTER A RAIN EVENT. INSPECTION FORMS SHALL BE COMPLETED AS PER SECTION 01 55 00-ENVIRONMENTAL PROTECTION. E&SCS THAT ARE NOTED TO BE DAMAGED OR INEFFECTIVE SHALL BE REPAIRED OR MODIFIED WITHIN 7 CALENDAR DAYS OR PRIOR TO THE NEXT RAIN EVENT, WHICHEVER OCCURS FIRST.
19. E&SCS SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH TDEC'S EROSION AND SEDIMENT CONTROL HANDBOOK.
20. REFER TO SECTION 01 55 00-ENVIRONMENTAL PROTECTION FOR ADDITIONAL E&SC REQUIREMENTS.
21. E&SCS SHALL BE MAINTAINED UNTIL FINAL STABILIZATION, AS APPROVED BY THE COMPANY, IS COMPLETE. SELLER IS RESPONSIBLE FOR REMOVAL OF E&SCS, WITHOUT DAMAGING FINAL STABILIZATION, AND PROPER DISPOSAL OF E&SCS OFF-SITE. SEDIMENT COLLECTED IN E&SCS SHALL EITHER BE REMOVED AND PROPERLY DISPOSED OFF-SITE OR STABILIZED TO PREVENT EROSION, WITH STABILIZATION APPROVED BY THE COMPANY.
22. SEDIMENT SHALL BE PREVENTED FROM DISCHARGING FROM THE PROJECT SITE.
23. WORK AND DISTURBANCE WITHIN RIPARIAN ZONES SHALL BE MINIMIZED.
24. EXISTING VEGETATION SHALL BE PROTECTED AS MUCH AS FEASIBLE.
25. STOCKPILES SHALL BE COVERED WITH PLASTIC PRIOR TO RAIN EVENTS, UNLESS OTHERWISE APPROVED BY THE COMPANY. IF PLASTIC IS NOT FEASIBLE, SEDIMENT CONTROLS SHALL BE INSTALLED AS DIRECTED BY THE COMPANY.
26. FOLLOWING INITIAL SOIL DISTURBANCE, IF WORK ON A PORTION OF THE PROJECT SITE PERMANENTLY OR TEMPORARILY CEASES, TEMPORARY OR PERMANENT STABILIZATION SHALL BE COMPLETED WITHIN:

    A. SEVEN (7) CALENDAR DAYS FOR ALL PERIMETER CONTROLS, DIKES, SWALES, DITCHES, PERIMETER SLOPES, AND ALL SLOPES GREATER THAN 3 HORIZONTAL TO 1 VERTICAL (3:1) AND,

    B. FIFTEEN (15) CALENDAR DAYS FOR ALL OTHER DISTURBED OR GRADED AREAS.

    THIS DOES NOT APPLY TO THOSE AREAS WHICH ARE CURRENTLY BEING USED FOR STORAGE, STOCKPILES, OR WHERE ACTIVE CONSTRUCTION ACTIVITIES ARE OCCURRING. MAINTENANCE SHALL BE PERFORMED TO ENSURE THAT STABILIZED AREAS CONTINUOUSLY MEET COMPANY'S APPROVAL.
27. COVER SEEDED SLOPES WHERE GRADE IS 3 HORIZONTAL TO 1 VERTICAL (3:1) OR GREATER OR OTHER AREAS AT LOCATIONS SHOWN ON PLANS WITH EXCELSIOR MATTING.
28. SELLER SHALL INSTALL APPROPRIATE SEDIMENTATION CONTROL (E.G, SILT FENCE) ON DOWNHILL/DOWNGRADIENT SIDE OF ANY STOCKPILE OR DISTURBED AREA THAT SHALL REMAIN FOR MORE THAN ONE DAY. SILT FENCE MAY NOT BE REQUIRED FOR TRENCH EXCAVATION AND BACKFILL THAT IS COMPLETED ON THE SAME DAY. EXCAVATION EQUIPMENT AND STOCKPILES SHALL BE ON THE UPHILL SIDE OF THE EXCAVATION UNLESS AN ALTERNATIVE ARRANGEMENT IS APPROVED BY THE COMPANY.
29. SEEDING AND MULCHING (BOTH TEMPORARY AND PERMANENT) SHALL COMPLY WITH REQUIREMENTS IN SECTION 31 25 00-SEEDING AND SECTION 31 22 70-EROSION CONTROL.
30. ROADWAYS SHALL BE KEPT CLEARED OF ACCUMULATED SEDIMENT. BULK CLEARING OF ACCUMULATED SEDIMENT SHALL NOT INCLUDE FLUSHING THE AREA WITH WATER. SEDIMENT SHALL BE RETURNED TO THE LIKELY POINT OF ORIGIN OR OTHER AREA APPROVED BY THE COMPANY.
31. THE SELLER SHALL CONTROL WASTES, GARBAGE, DEBRIS, WASTEWATER, AND OTHER SUBSTANCES ON THE SITE IN SUCH A WAY THAT THEY SHALL NOT BE TRANSPORTED FROM THE SITE BY STORM WATER RUNOFF.
32. E&SCS MAY BE TEMPORARILY REMOVED IF NECESSARY TO ACCOMPLISH WORK ACTIVITIES, BUT MUST BE REINSTALLED BEFORE ANY RAIN EVENT AND BEFORE THE END OF THE WORK SHIFT.
33. ROUTINE INSPECTIONS OF E&SCS SHALL INCLUDE OBSERVATIONS OF LOCATIONS WHERE STORM WATER RUNOFF IS DISCHARGED TO A RECEIVING STREAM TO ENSURE THAT E&SCS ARE EFFECTIVELY PREVENTING DISCHARGE OF SEDIMENT TO THE RECEIVING STREAM. DURING DEWATERING ACTIVITIES, LOCATIONS WHERE WATER IS DISCHARGED FROM THOSE ACTIVITIES (BOTH STORM DRAINS AND RECEIVING STREAMS) SHALL BE INSPECTED TO VERIFY THAT SEDIMENT IS BEING ADEQUATELY CONTROLLED. IF SEDIMENTATION CONTROLS ASSOCIATED WITH DEWATERING ACTIVITIES ARE FOUND TO BE INEFFECTIVE, THE DEWATERING ACTIVITY SHALL BE HALTED AND EFFECTIVE CONTROLS SHALL BE IMPLEMENTED BEFORE THE ACTIVITY IS RESUMED.
34. CONTRACTOR SHALL COMPLY WITH ALL SPECIAL AND GENERAL CONDITIONS DESCRIBED BY THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) - GENERAL AQUATIC RESOURCE ALERATION PERMIT FOR UTILITY LINE CROSSINGS, DATED APRIL 7, 2015.
35. CONTRACTOR SHALL COMPLY WITH ALL SPECIAL AND GENERAL CONDITIONS DESCRIBED BY THE TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION (TDEC) - GENERAL AQUATIC RESOURCE ALTERATION PERMIT FOR CONSTRUCTION OR REMOVAL OF MINOR ROAD CROSSINGS. DATED APRIL 7, 2015.

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SECTION AND DETAIL KEY

NUMBER OF SECTION OR DETAIL — DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
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REVISION OR ISSUE PURPOSE — REVISION OR ISSUE REVIEWERS — INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE		
BENJAMIN C. NEMEC, REGISTERED ENGINEER, AGRICULTURE COMMERCE No. 104112, STATE OF TENNESSEE — 7/11/2019	DSN	BCN
	DRW	BSP
	CHK	
	DEPT	
	PE	COLLINS
	PJ	MARK CONNELL
	REQ	TBD
REV. DATE	UTB	

DRAWING APPROVALS

A/E DRAWING NUMBER
C0000

UT-BATTELLE
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-000R22725
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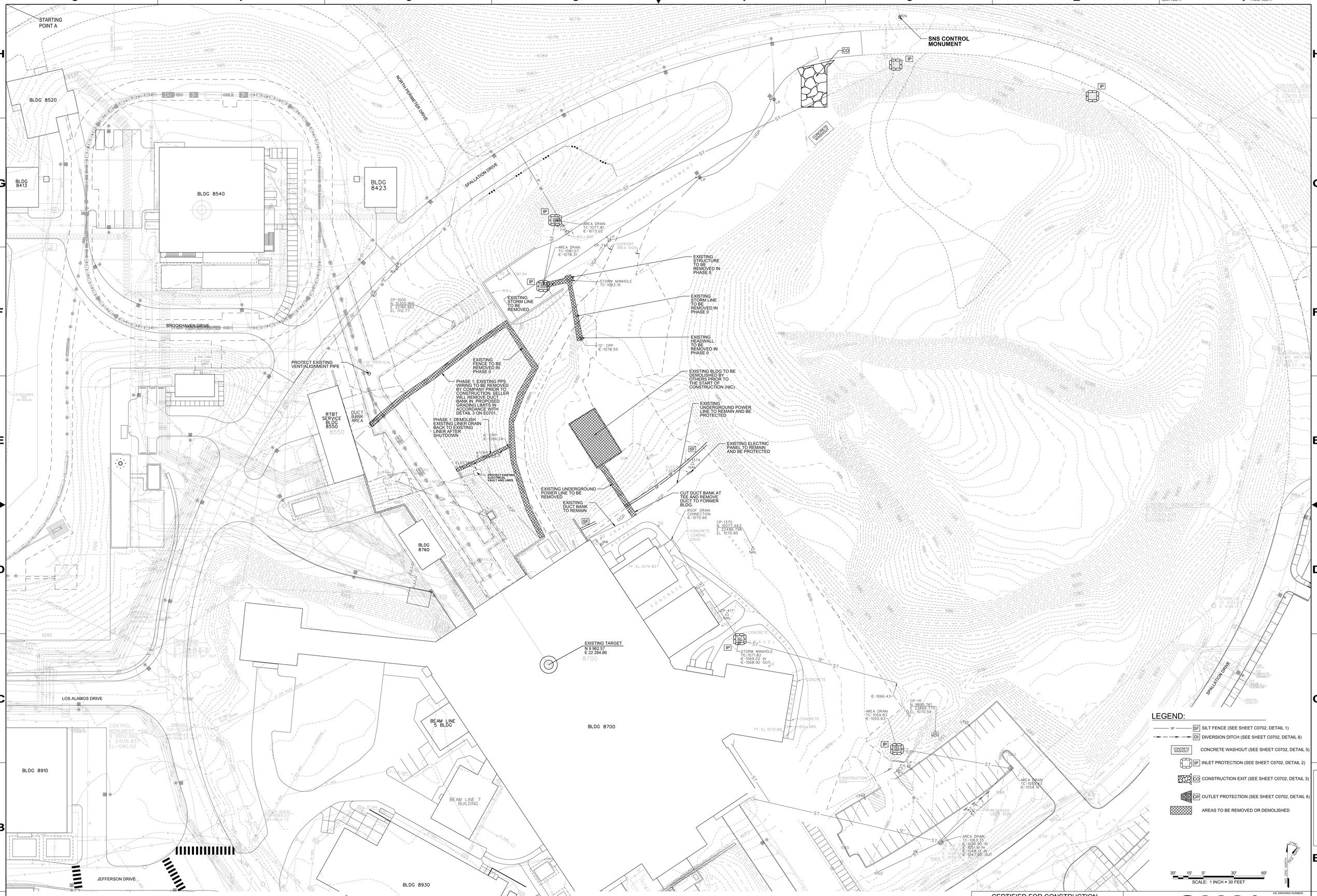
PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Site Access & General Notes

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200	4	1	1	P	U

51	52	53	WBS	REV
NC	NA			0

8	7	6	5	4	3	2	1



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NUMBER OF SECTION OR DETAIL

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SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE

BENJAMIN C. MILLER — REGISTERED PROFESSIONAL ENGINEER — 242492 — STATE OF TENNESSEE

7/11/19

REV. DATE

DRAWING APPROVALS

DSN	BCN
DRW	BSP
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD
UTB	

A/E DRAWING NUMBER

C0021

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UT-BATTELLE, LLC. © Oak Ridge, Tennessee

PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

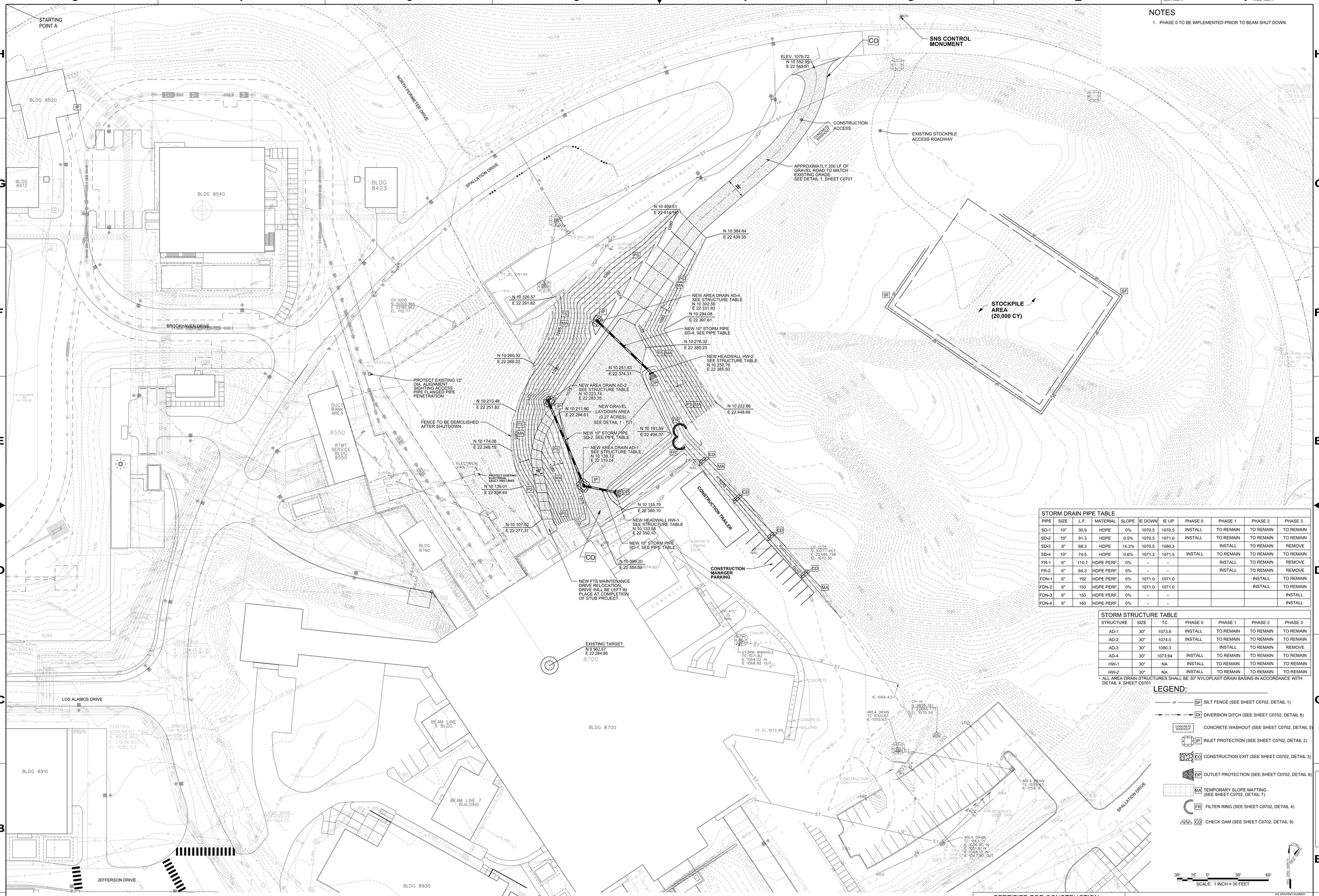
Existing Conditions, Demolition & Initial Erosion Control Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U
51		52		53	WBS					REV
NC		NA								0

NEXT ASS'Y: | FINAL ASS'Y:

NOTES

1. PHASE 0 TO BE IMPLEMENTED PRIOR TO BEAM SHUT DOWN.



STORM DRAIN PIPE TABLE

PIPE	SIZE	L.F.	MATERIAL	SLOPE	IE DOWN	IE UP	PHASE 0	PHASE 1	PHASE 2	PHASE 3
SD-1	10"	30.9	HDPE	0%	1070.5	1070.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-2	10"	91.3	HDPE	0.5%	1070.5	1071.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-3	8"	68.3	HDPE	14.3%	1070.5	1080.3		INSTALL	TO REMAIN	REMOVE
SD-4	10"	74.5	HDPE	0.6%	1071.2	1071.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
FR-1	6"	110.7	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FR-2	6"	64.3	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FDN-1	6"	192	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-2	6"	150	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-3	6"	150	HDPE PERF.	0%	-	-				INSTALL
FDN-4	6"	160	HDPE PERF.	0%	-	-				INSTALL

STORM STRUCTURE TABLE

STRUCTURE	SIZE	TC	PHASE 0	PHASE 1	PHASE 2	PHASE 3
AD-1	30"	1073.8	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-2	30"	1074.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-3	30"	1080.3		INSTALL	TO REMAIN	REMOVE
AD-4	30"	1073.94	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-1	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-2	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN

* ALL AREA DRAIN STRUCTURES SHALL BE 30" NYLOPLAST DRAIN BASINS IN ACCORDANCE WITH DETAIL 4, SHEET C0701

LEGEND:

- SF — SILT FENCE (SEE SHEET C0702, DETAIL 1)
- DI — DIVERSION DITCH (SEE SHEET C0702, DETAIL 8)
- CONCRETE WASHOUT — CONCRETE WASHOUT (SEE SHEET C0702, DETAIL 5)
- IP — INLET PROTECTION (SEE SHEET C0702, DETAIL 2)
- CO — CONSTRUCTION EXIT (SEE SHEET C0702, DETAIL 3)
- OP — OUTLET PROTECTION (SEE SHEET C0702, DETAIL 6)
- MA — TEMPORARY SLOPE MATTING (SEE SHEET C0702, DETAIL 7)
- FR — FILTER RING (SEE SHEET C0702, DETAIL 4)
- CD — CHECK DAM (SEE SHEET C0702, DETAIL 9)

SCALE: 1 INCH = 30 FEET

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SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																									

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE — BENJAMIN C. NEWELL — REGISTERED PROFESSIONAL ENGINEER — STATE OF TENNESSEE

REV.	DATE	DRAWING APPROVALS
		DSN BCN
		DRW BSP
		CHK
		DEPT
		PE COLLINS
		PJ MARK CONNELL
		REQ TBD
		UTB

A/E DRAWING NUMBER

C0201

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UT-BATTELLE, LLC, © Oak Ridge, Tennessee

PROJECT NAME:

PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Phase 0 - Pre-shutdown Excavation Grading, Drainage & Intermediate Erosion Control Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U

51	52	53	WBS	REV
NC	NA			0

NEXT ASS'Y: | FINAL ASS'Y:

STARTING POINT A

NORTH PERIMETER DRIVE

SPALLATION DRIVE

BROOKHAVEN DRIVE

BLDG 8540

BLDG 8423

RTBT SERVICE BLDG 8550

BLDG 8760

DUCT BANK AREA

ASPHALT PAVEMENT

CONCRETE WASHOUT

FINAL LOCATION OF CONCRETE WASHOUT TO BE APPROVED BY THE COMPANY.

EXISTING STOCKPILE ACCESS ROADWAY

PROPOSED STOCKPILE (20,000 CY)

ELEV. 1103.03
N 10 393.86
E 22 173.69

CONSTRUCTION ACCESS

BOLLARD

SUPPORT AREA SIGN

WALL

N 10 354.05
E 22 178.92

1102.2

PROPOSED GRAVEL LAYDOWN AREA (0.10 ACRES) SEE DETAIL 1 - C701.

N 10 300.02
E 22 143.12

1102.0

0.2%

1103.0

N 10 296.27
E 22 225.34

N 10 283.29
E 22 194.34

SEE NOTES 3 & 4 THIS SHEET

PROTECT EXISTING 12" DIA. ALIGNMENT SIGHTING ACCESS PIPE FLANGED PIPE PENETRATION

1091.5

N 10 262.49
E 22 141.47

1082.75

N 10 245.62
E 22 159.96

N 10 237.58
E 22 216.95

NEW FRENCH DRAIN FR-1, SEE PIPE TABLE & DETAIL 5, SHEET C0701

NEW FRENCH DRAIN FR-2 SEE PIPE TABLE & DETAIL 5, SHEET C0701

1082.75

FRENCH DRAIN DISCHARGE POINT N 10 183.28 E 22 211.66

NEW 8" STORM PIPE SD-3, SEE PIPE TABLE

1082.5

N 10 192.46
E 22 149.04

1091.5

N 10 170.21
E 22 132.14

SEE NOTE 2

PROTECT EXISTING ELECTRICAL VAULT AND LINES

N 10 143.21
E 22 255.72

PROTECT EXISTING ELECTRICAL LINES

1082.1

N 10 258.29
E 22 248.10

FRENCH DRAIN DISCHARGE POINT N 10 273.43 E 22 285.07

GRAVEL LAYDOWN AREA (0.27 ACRES)

NEW AREA DRAIN AD-3 SEE STRUCTURE TABLE N 10 165.06 E 22 249.30

AD-1

AD-2

AD-4

SD-1

SD-2

SD-4

HW-1

HW-2

CONSTRUCTION TRAILER

CONSTRUCTION MANAGER PARKING

CONCRETE LOADING DOCK

FTS MAINTENANCE DRIVE RELOCATION. DRIVE WILL BE LEFT IN PLACE AT COMPLETION OF STUB PROJECT.

NOTES

1. PHASE 1 TO BE IMPLEMENTED AFTER BEAM SHUT DOWN.
2. COORDINATE REMOVAL OF LINER HEADER PIPE AND DOWN DRAINS WITH LIMITS SHOWN ON SHEET C0401.
3. CONTRACTOR TO UTILIZE EXPLORATORY TRENCHING AND POTHOLING METHODOLOGY TO LOCATE EXISTING STRUCTURE DURING PROPOSED EXCAVATION.
4. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PROTECT THE EXISTING STRUCTURE FROM DAMAGE. CARE SHALL BE TAKEN WHEN UTILIZING MECHANIZED EQUIPMENT NEAR STRUCTURE. CONTRACTOR SHALL EMPLOY HAND EXCAVATION OTHER MEANS AS NECESSARY TO EXPOSE EXISTING STRUCTURE WITHOUT DAMAGE.
5. SHOTCRETE PERFORMANCE NOTES:

   A. SELLER TO INSTALL SHOTCRETE ON TEMPORARY SLOPES IN ACCORDANCE WITH THE REQUIREMENTS OF ACI 506R-16. SHOTCRETE SHALL BE DESIGNED TO ACT AS TEMPORARY EROSION CONTROL COVER DURING CONSTRUCTION.

   B. SELLER TO PROVIDE SUBMITTALS IN ACCORDANCE WITH SECTION 1.4 OF ACI 506R-16.

   C. SHOTECRETE SHALL BE NONSTRUCTURAL WET OR DRY MIX AND PLACED AT 1"MINIMUM THICKENESS IN AREAS SHOWN. SHOT FINISH IS ACCEPTABLE.

   D. DURING BACKFILL OPERATIONS, SHOTCRETE WILL BE BROKEN AND MIXED INTO THE FINAL BACKFILL AND COMPACTED AS PART OF THE SOIL MATRIX.

STORM DRAIN PIPE TABLE

PIPE	SIZE	L.F.	MATERIAL	SLOPE	IE DOWN	IE UP	PHASE 0	PHASE 1	PHASE 2	PHASE 3
SD-1	10"	30.9	HDPE	0%	1070.5	1070.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-2	10"	91.3	HDPE	0.5%	1070.5	1071.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-3	8"	68.3	HDPE	14.3%	1070.5	1080.3		INSTALL	TO REMAIN	REMOVE
SD-4	10"	74.5	HDPE	0.6%	1071.2	1071.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
FR-1	6"	110.7	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FR-2	6"	64.3	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FDN-1	6"	192	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-2	6"	150	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-3	6"	150	HDPE PERF.	0%	-	-				INSTALL
FDN-4	6"	160	HDPE PERF.	0%	-	-				INSTALL

STORM STRUCTURE TABLE

STRUCTURE	SIZE	TC	PHASE 0	PHASE 1	PHASE 2	PHASE 3
AD-1	30"	1073.8	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-2	30"	1074.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-3	30"	1080.3		INSTALL	TO REMAIN	REMOVE
AD-4	30"	1073.94	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-1	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-2	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN

* ALL AREA DRAIN STRUCTURES SHALL BE 30" NYLOPLAST DRAIN BASINS IN ACCORDANCE WITH DETAIL 4, SHEET C0701

LEGEND:

- SF — SILT FENCE (SEE SHEET C0702, DETAIL 1)
- DI — DIVERSION DITCH (SEE SHEET C0702, DETAIL 8)
- CONCRETE WASHOUT — CONCRETE WASHOUT (SEE SHEET C0702, DETAIL 5)
- IP — INLET PROTECTION (SEE SHEET C0702, DETAIL 2)
- CO — CONSTRUCTION EXIT (SEE SHEET C0702, DETAIL 3)
- OP — OUTLET PROTECTION (SEE SHEET C0702, DETAIL 6)
- MA — TEMPORARY SLOPE MATTING (SEE SHEET C0702, DETAIL 7)
- SC — SHOTCRETE - SEE NOTES C0202
- FR — FILTER RING (SEE SHEET C0702, DETAIL 4)
- CD — CHECK DAM (SEE SHEET C0702, DETAIL 9)
- PS — PERMANENT SEEDING (SEE SHEET C0702, DETAIL 10)
- TS — TEMPORARY SEEDING (SEE SHEET C0702, DETAIL 10)

SCALE: 1 INCH = 20 FEET

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																									
REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS															INTER-DISCIPLINE CHECK									

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE

BENJAMIN C. NEWER — REGISTERED ENGINEER — AGENCY OF DELAWARE — STATE OF TENNESSEE

REV.	DATE	DRAWING APPROVALS
		DSN BCN
		DRW BSP
		CHK
		DEPT
		PE COLLINS
		PJ MARK CONNELL
		REQ TBD
		UTB

A/E DRAWING NUMBER

C0202

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Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725
UT-BATTELLE, LLC, © Oak Ridge, Tennessee

PROJECT NAME:

PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Phase 1 - Initial Excavation Grading, Drainage & Intermediate Erosion Control Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U

51	52	53	WBS	REV
NC	NA			0

NEXT ASS'Y: | FINAL ASS'Y:

NOTES

1. ALL COORDINATES AND BEARINGS PROVIDED ARE BASED ON SNS GRID COORDINATE SYSTEM.
2. PLEASE SEE STRUCTURAL DRAWING S0101 FOR LAYOUT OF PROPOSED STRUCTURE FROM ESTABLISHED LOCATION OF WORK POINT A.
3. CONTRACTOR SHALL EMPLOYEE A REGISTERED SURVEYOR TO PERFORM PROJECT LAYOUT. PRIOR TO CONSTRUCTION AN A-BUILT OF THE EXISTING EXPOSED TUNNEL STRUCTURE SHALL BE PERFORMED TO CONFIRM DIMENSIONS ON PROPOSED PLANS. THE AS-BUILT AND SITE LAYOUT FOR THE PROPOSE STRUCTURE SHALL BE PROVIDED IN ELECTRONIC CAD FORMAT TO THE COMPANY AND A/E FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

STARTING POINT A

NORTH PERIMETER DRIVE

SPALLATION DRIVE

BROOKHAVEN DRIVE

BLDG 8540

BLDG 8423

RTBT SERVICE BLDG 8550

BLDG 8760

BLDG 8700

ASPHALT PAVEMENT

CONCRETE WASHOUT

EXISTING STOCKPILE ACCESS ROADWAY

PROPOSED STOCKPILE (20,000 CY)

PROPOSED GRAVEL LAYDOWN AREA (0.07 ACRES)

GRAVEL LAYDOWN AREA (0.27 ACRES)

WORK POINT A
SEE NOTE 2 & 3
N 10 281.50
E 22 193.95

TOP OF WALL
1082.25
N 10 257.07
E 22 133.50

GRAY SHADE: PROPOSED LIMITS OF 5' WIDE EXPOSED EXISTING RTBT TOP SLAB.

PROTECT EXISTING 12" DIA. ALIGNMENT SIGHTING ACCESS PIPE FLANGED PIPE PENETRATION

12" VERTICAL PIPE

TOP OF WALL
1082.25
N 10 262.02
E 22 270.84

SHEETPILE WALL

NEW FOUNDATION DRAIN FDN-1, SEE PIPE TABLE

FR-1

12" VERTICAL CURB, SEE STRUCTURAL TOP OF CURB 1092.25

N 10 202.57
E 22 151.31

TOP OF WALL
1082.25
N 10 214.22
E 22 254.33

NEW FOUNDATION DRAIN FDN-2 SEE PIPE TABLE

SHEETPILE WALL

FR-2

TOP OF WALL
1082.25
N 10 198.24
E 22 144.74

PROTECT EXISTING ELECTRICAL VAULT AND LINES

PROTECT EXISTING ELECTRICAL LINES

FTS MAINTENANCE DRIVE RELOCATION. DRIVE WILL BE LEFT IN PLACE AT COMPLETION OF STUB PROJECT.

CONSTRUCTION TRAILER

CONSTRUCTION MANAGER PARKING

CONCRETE LOADING DOCK

WALL

BOLLARD

SUPPORT AREA SIGN

ELECTRIC PANEL

ELECTRICAL VAULT

LINER

DUCT BANK AREA

AD-1 AD-2 AD-3 AD-4 SD-1 SD-2 SD-3 SD-4 HW-1 HW-2

4 C0501

3 C0501

STORM DRAIN PIPE TABLE

PIPE	SIZE	L.F.	MATERIAL	SLOPE	IE DOWN	IE UP	PHASE 0	PHASE 1	PHASE 2	PHASE 3
SD-1	10"	30.9	HDPE	0%	1070.5	1070.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-2	10"	91.3	HDPE	0.5%	1070.5	1071.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-3	8"	68.3	HDPE	14.3%	1070.5	1080.3		INSTALL	TO REMAIN	REMOVE
SD-4	10"	74.5	HDPE	0.6%	1071.2	1071.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
FR-1	6"	110.7	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FR-2	6"	64.3	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FDN-1	6"	192	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-2	6"	150	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-3	6"	150	HDPE PERF.	0%	-	-				INSTALL
FDN-4	6"	160	HDPE PERF.	0%	-	-				INSTALL

STORM STRUCTURE TABLE

STRUCTURE	SIZE	TC	PHASE 0	PHASE 1	PHASE 2	PHASE 3
AD-1	30"	1073.8	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-2	30"	1074.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-3	30"	1080.3		INSTALL	TO REMAIN	REMOVE
AD-4	30"	1073.94	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-1	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-2	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN

* ALL AREA DRAIN STRUCTURES SHALL BE 30" NYLOPLAST DRAIN BASINS IN ACCORDANCE WITH DETAIL 4, SHEET C0701

LEGEND:

- SF — SILT FENCE (SEE SHEET C0702, DETAIL 1)
- DI — DIVERSION DITCH (SEE SHEET C0702, DETAIL 8)
- CONCRETE WASHOUT — CONCRETE WASHOUT (SEE SHEET C0702, DETAIL 5)
- IP — INLET PROTECTION (SEE SHEET C0702, DETAIL 2)
- CO — CONSTRUCTION EXIT (SEE SHEET C0702, DETAIL 3)
- OP — OUTLET PROTECTION (SEE SHEET C0702, DETAIL 6)
- MA — TEMPORARY SLOPE MATTING (SEE SHEET C0702, DETAIL 7)
- SC — SHOTCRETE - SEE NOTES C0202
- FR — FILTER RING (SEE SHEET C0702, DETAIL 4)
- CD — CHECK DAM (SEE SHEET C0702, DETAIL 9)
- PS — PERMANENT SEEDING (SEE SHEET C0702, DETAIL 10)
- TS — TEMPORARY SEEDING (SEE SHEET C0702, DETAIL 10)

20' 10' 0' 20' 40'
SCALE: 1 INCH = 20 FEET

27°46' WEST TRUE NORTH

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE

BENJAMIN C. NEWELL — REGISTERED ENGINEER — No. 120147 — STATE OF TENNESSEE

REV. DATE

DRAWING APPROVALS

DSN	BCN
DRW	BSP
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD
UTB	

A/E DRAWING NUMBER

C0203

UT-BATTELLE
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-000R22725
UT-BATTELLE, LLC, © Oak Ridge, Tennessee

PROJECT NAME:

PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Phase 2 - Sheet Pile Excavation Grading, Drainage & Intermediate Erosion Control Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U

51	52	53		REV
NC	NA		WBS	0

NEXT ASS'Y: | FINAL ASS'Y:

STARTING POINT A

NORTH PERIMETER DRIVE

SPALLATION DRIVE

BROOKHAVEN DRIVE

BLDG 8540

BLDG 8423

BLDG 8760

BLDG 8700

RTBT SERVICE BLDG 8550

DUCT BANK AREA

GRAVEL LAYDOWN AREA (0.27 ACRES)

ASPHALT PAVEMENT

CONCRETE LOADING DOCK

CONSTRUCTION TRAILER

CONSTRUCTION MANAGER PARKING

FTS MAINTENANCE DRIVE TO REMAIN

REMOVE CONSTRUCTION ENTRANCE AND LAYDOWN AREA GRAVEL AND RESTORE SITE TO EXISTING CONDITION

REPLACE CONSTRUCTION EXIT STONE WITH GRAVEL PER DETAIL 1 ON C0701.

CONCRETE WASHOUT

REMOVE CONRETE WASHOUT AND RESTORE AREA.

EXISTING STOCKPILE ACCESS ROADWAY

PROPOSED STOCKPILE (20,000 CY)

N 10 353.36
E 22 179.49

WORK POINT A
SEE NOTE 2 & 3
N 10 281.50
E 22 193.95

N 10 272.46
E 22 131.92

N 10 146.58
E 22 197.45

LIMITS OF NEW LINER SEE SHEET C0401

LINER

PROTECT EXISTING 12" DIA. ALIGNMENT SIGHTING ACCESS PIPE FLANGED PIPE PENETRATION

PROTECT EXISTING ELECTRICAL VAULT AND LINES

CONTRACTOR TO PROTECT EXISTING ELECTRICAL LINES

REINSTALL PREVIOUSLY REMOVED PPS DUCT BANK IN ACCORDANCE WITH DETAIL 3 ON E0701.

NEW FOUNDATION DRAIN FDN-3

NEW FOUNDATION DRAIN FDN-4

NEW FOUNDATION DRAIN FDN-4, SEE PIPE TABLE

NEW FOUNDATION DRAIN FDN-3, SEE PIPE TABLE

12" VERTICAL CURB, SEE STRUCTURAL TOP OF CURB 1092.25

REMOVE EXISTING STORM PIPE SD-3 AND AREA DRAIN AD-3, PLUG SD-3 INLET AT AD-2

BOLLARD

SUPPORT AREA SIGN

ELECTRICAL VAULT

ELECTRIC PANEL

CONCRETE

ASPHALT

GRAVEL

CONC

NOTES

1. ALL COORDINATES AND BEARINGS PROVIDED ARE BASED ON SNS GRID COORDINATE SYSTEM.
2. PLEASE SEE STRUCTURAL DRAWINGS FOR LAYOUT OF PROPOSED STRUCTURE FROM ESTABLISHED LOCATION FOR WP C.
3. CONTRACTOR SHALL EMPLOYEE A REGISTERED SURVEYOR TO PERFORM PROJECT LAYOUT. PRIOR TO CONSTRUCTION AN A-BUILT OF THE EXISTING EXPOSED TUNNEL STRUCTURE SHALL BE PERFORMED TO CONFIRM DIMENSIONS ON PROPOSED PLANS. THE AS-BUILT AND SITE LAYOUT FOR THE PROPOSE STRUCTURE SHALL BE PROVIDED IN ELECTRONIC CAD FORMAT TO THE COMPANY AND A/E FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.

STORM DRAIN PIPE TABLE

PIPE	SIZE	L.F.	MATERIAL	SLOPE	IE DOWN	IE UP	PHASE 0	PHASE 1	PHASE 2	PHASE 3
SD-1	10"	30.9	HDPE	0%	1070.5	1070.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-2	10"	91.3	HDPE	0.5%	1070.5	1071.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
SD-3	8"	68.3	HDPE	14.3%	1070.5	1080.3		INSTALL	TO REMAIN	REMOVE
SD-4	10"	74.5	HDPE	0.6%	1071.2	1071.5	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
FR-1	6"	110.7	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FR-2	6"	64.3	HDPE PERF.	0%	-	-		INSTALL	TO REMAIN	REMOVE
FDN-1	6"	192	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-2	6"	150	HDPE PERF.	0%	1071.0	1071.0			INSTALL	TO REMAIN
FDN-3	6"	150	HDPE PERF.	0%	-	-				INSTALL
FDN-4	6"	160	HDPE PERF.	0%	-	-				INSTALL

STORM STRUCTURE TABLE

STRUCTURE	SIZE	TC	PHASE 0	PHASE 1	PHASE 2	PHASE 3
AD-1	30"	1073.8	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-2	30"	1074.0	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
AD-3	30"	1080.3		INSTALL	TO REMAIN	REMOVE
AD-4	30"	1073.94	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-1	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN
HW-2	30"	NA	INSTALL	TO REMAIN	TO REMAIN	TO REMAIN

* ALL AREA DRAIN STRUCTURES SHALL BE 30" NYLOPLAST DRAIN BASINS IN ACCORDANCE WITH DETAIL 4, SHEET C0701

LEGEND:

- SF — SILT FENCE (SEE SHEET C0702, DETAIL 1)
- DI — DIVERSION DITCH (SEE SHEET C0702, DETAIL 8)
- CONCRETE WASHOUT — CONCRETE WASHOUT (SEE SHEET C0702, DETAIL 5)
- IP — INLET PROTECTION (SEE SHEET C0702, DETAIL 2)
- CO — CONSTRUCTION EXIT (SEE SHEET C0702, DETAIL 3)
- OP — OUTLET PROTECTION (SEE SHEET C0702, DETAIL 6)
- MA — TEMPORARY SLOPE MATTING (SEE SHEET C0702, DETAIL 7)
- FR — FILTER RING (SEE SHEET C0702, DETAIL 4)
- CD — CHECK DAM (SEE SHEET C0702, DETAIL 9)
- PS — PERMANENT SEEDING (SEE SHEET C0702, DETAIL 10)
- TS — TEMPORARY SEEDING (SEE SHEET C0702, DETAIL 10)

20' 10' 0' 20' 40'
SCALE: 1 INCH = 20 FEET

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NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY

CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																									

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE: BENJAMIN C. MEHRING, REGISTERED PROFESSIONAL ENGINEER, AGRICULTURE, STATE OF TENNESSEE

REV. | DATE | UTB

DRAWING APPROVALS

DSN	BCN
DRW	BSP
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD

A/E DRAWING NUMBER

C0204

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U.S. GOVERNMENT contract DE-AC05-000R22725
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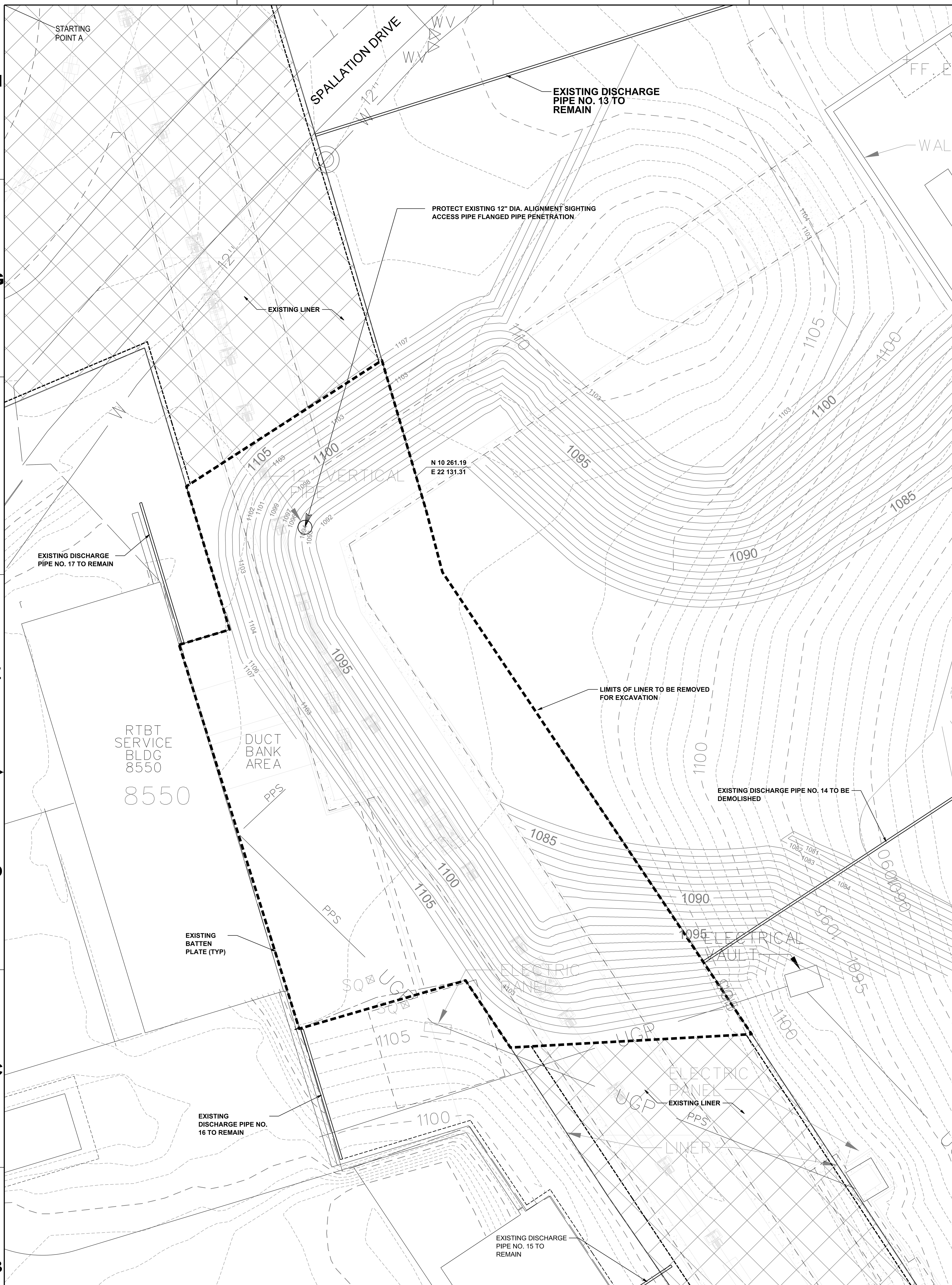
PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Phase 3 - Partial Backfill Grading, Drainage & Final Erosion Control Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U

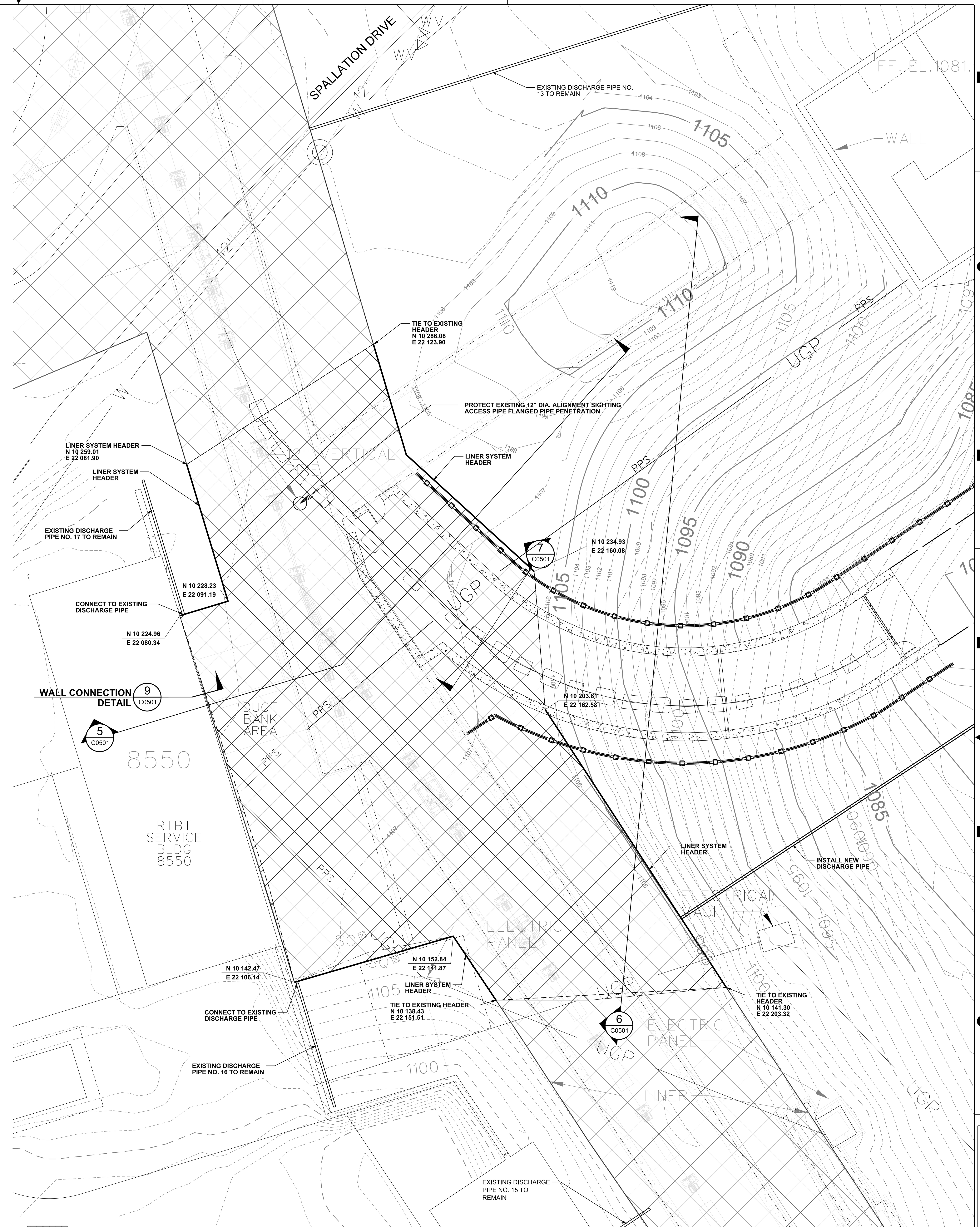
51	52	53		
NC	NA		WBS	REV 0


STARTING POINT A
SPALLATION DRIVE
EXISTING DISCHARGE PIPE NO. 13 TO REMAIN
PROTECT EXISTING 12" DIA. ALIGNMENT SIGHTING ACCESS PIPE FLANGED PIPE PENETRATION
EXISTING LINER
N 10 261.19
E 22 131.31
EXISTING DISCHARGE PIPE NO. 17 TO REMAIN
LIMITS OF LINER TO BE REMOVED FOR EXCAVATION
RTBT SERVICE BLDG 8550
DUCT BANK AREA
8550
EXISTING DISCHARGE PIPE NO. 14 TO BE DEMOLISHED
EXISTING BATTEN PLATE (TYP)
ELECTRICAL VAULT
ELECTRIC PANEL
EXISTING LINER
EXISTING DISCHARGE PIPE NO. 16 TO REMAIN
EXISTING DISCHARGE PIPE NO. 15 TO REMAIN
BLDG 8760

EMBANKMENT LINER DEMOLITION

EXISTING EMBANKMENT LINER
LIMITS OF EMBANKMENT LINER REMOVED FOR STUB CONSTRUCTION

0' 5' 10'
SCALE: 1"=10'


SPALLATION DRIVE
EXISTING DISCHARGE PIPE NO. 13 TO REMAIN
TIE TO EXISTING HEADER
N 10 286.08
E 22 123.90
PROTECT EXISTING 12" DIA. ALIGNMENT SIGHTING ACCESS PIPE FLANGED PIPE PENETRATION
LINER SYSTEM HEADER
N 10 259.01
E 22 081.90
LINER SYSTEM HEADER
EXISTING DISCHARGE PIPE NO. 17 TO REMAIN
N 10 234.93
E 22 160.08
N 10 228.23
E 22 091.19
CONNECT TO EXISTING DISCHARGE PIPE
N 10 224.96
E 22 080.34
WALL CONNECTION DETAIL 9 C0501
5 C0501
7 C0501
N 10 203.81
E 22 162.58
RTBT SERVICE BLDG 8550
DUCT BANK AREA
8550
LINER SYSTEM HEADER
INSTALL NEW DISCHARGE PIPE
ELECTRICAL VAULT
ELECTRIC PANEL
N 10 152.84
E 22 141.87
N 10 142.47
E 22 106.14
LINER SYSTEM HEADER
TIE TO EXISTING HEADER
N 10 138.43
E 22 151.51
TIE TO EXISTING HEADER
N 10 141.30
E 22 203.32
CONNECT TO EXISTING DISCHARGE PIPE
6 C0501
EXISTING DISCHARGE PIPE NO. 16 TO REMAIN
EXISTING DISCHARGE PIPE NO. 15 TO REMAIN
BLDG 8760
SNS GRID NORTH
TRUE NORTH
27°46'±

EXISTING EMBANKMENT LINER
LIMITS OF EMBANKMENT LINER REPLACED FOR STUB CONSTRUCTION

0' 5' 10'
SCALE: 1"=10'

EMBANKMENT LINER INSTALLATION

BARGE DESIGN SOLUTIONS
1110 Market Street // Suite 200 // Chattanooga, Tennessee 37402
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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

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0	---	4	---																										

REVISION OR ISSUE PURPOSE — REVISION OR ISSUE REVIEWERS — INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE		
BENJAMIN C. NEMEC, REGISTERED ENGINEER, AGRICULTURE COMMERCE, No. 104112, STATE OF TENNESSEE, 7/11/2019	DSN	BCN
	DRW	BSP
	CHK	
	DEPT	
	PE	COLLINS
	PJ	MARK CONNELL
	REQ	TBD
REV. DATE	UTB	

DRAWING APPROVALS

A/E DRAWING NUMBER
C0401

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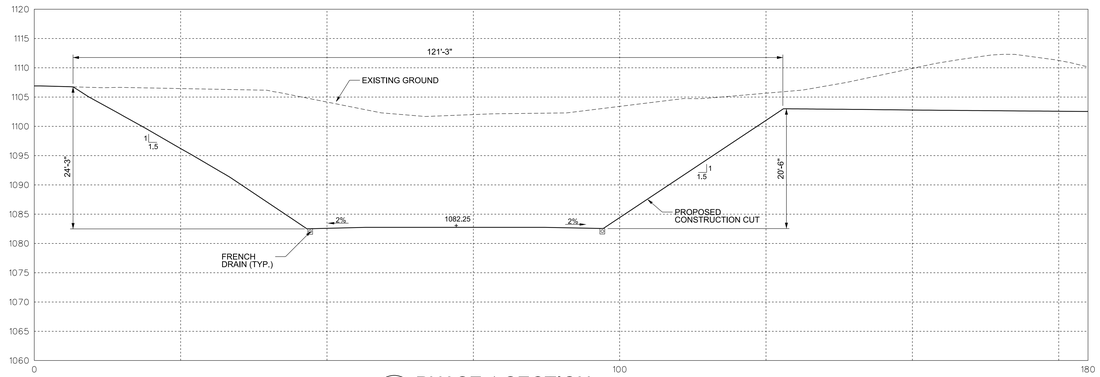
PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

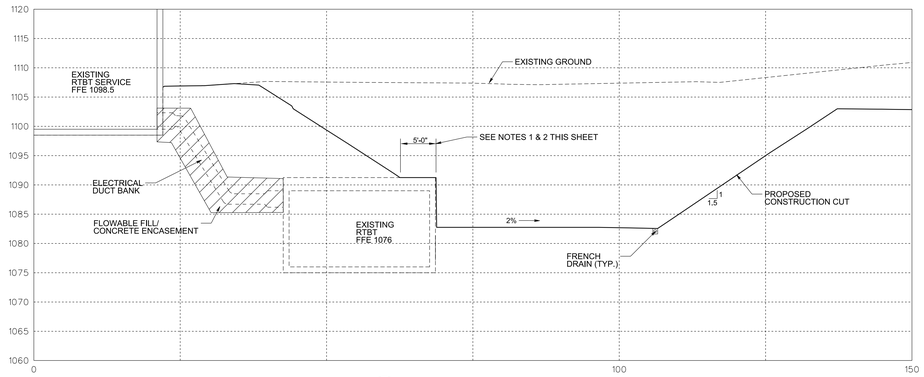
Embankment Liner Demolition & Installation Plan

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	P	U
51	52	53	WBS							REV
NC	NA									0

STARTING POINT A



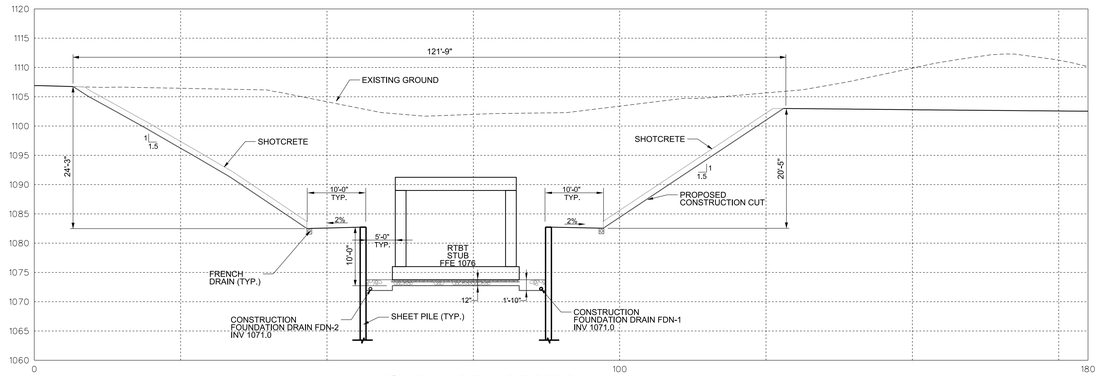
1 C0202 PHASE 1 SECTION
SCALE: 1" = 10'-0"



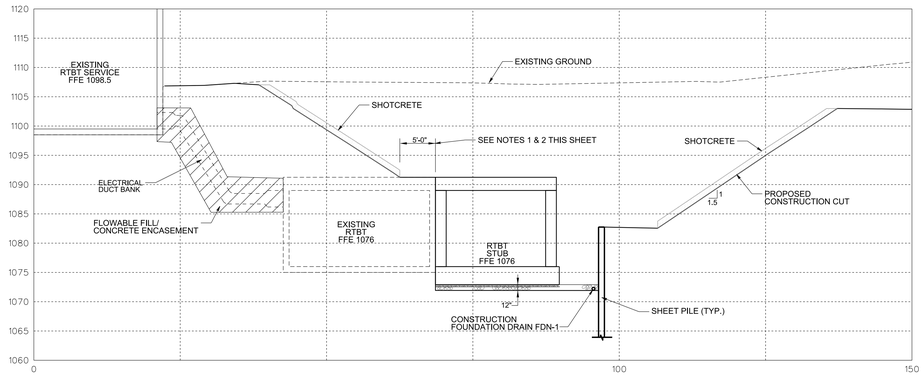
2 C0202 PHASE 1 SECTION
SCALE: 1" = 10'-0"

NOTES:

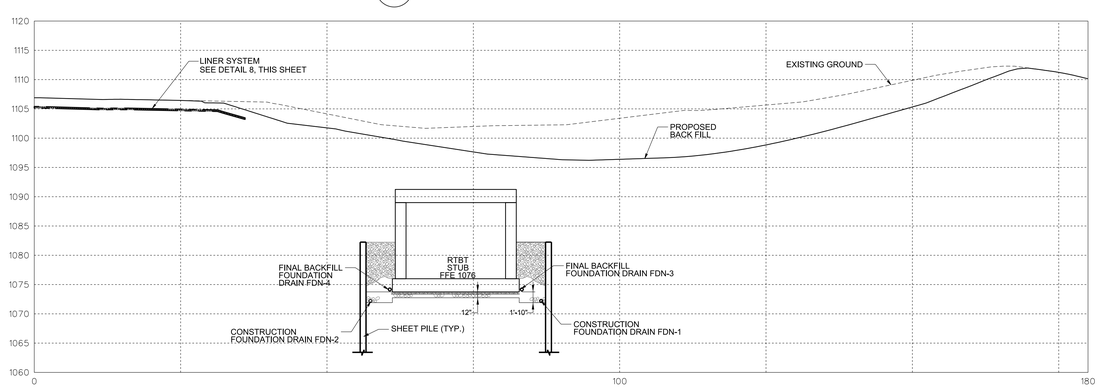
1. CONTRACTOR TO UTILIZE EXPLORATORY TRENCHING AND POTHOLING METHODOLOGY TO LOCATE EXISTING STRUCTURE DURING PROPOSED EXCAVATION.
2. CONTRACTOR SHALL TAKE WHATEVER MEANS NECESSARY TO PROTECT THE EXISTING STRUCTURE FROM DAMAGE. CARE SHALL BE TAKEN WHEN UTILIZING MECHANIZED EQUIPMENT NEAR STRUCTURE. CONTRACTOR SHALL EMPLOY HAND EXCAVATION OTHER MEANS AS NECESSARY TO EXPOSE EXISTING STRUCTURE WITHOUT DAMAGE.



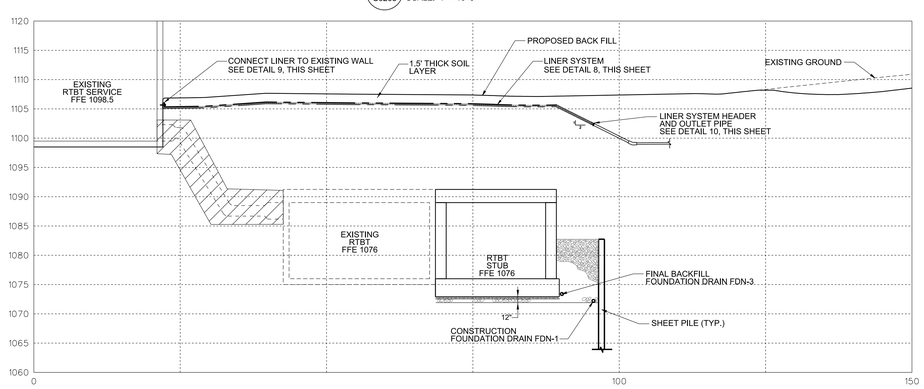
3 C0203 PHASE 2 SECTION
SCALE: 1" = 10'-0"



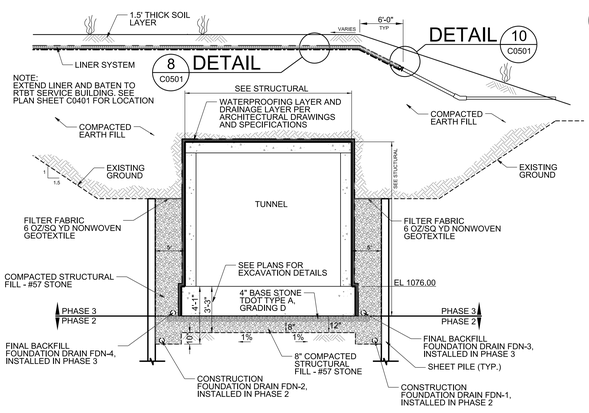
4 C0203 PHASE 2 SECTION
SCALE: 1" = 10'-0"



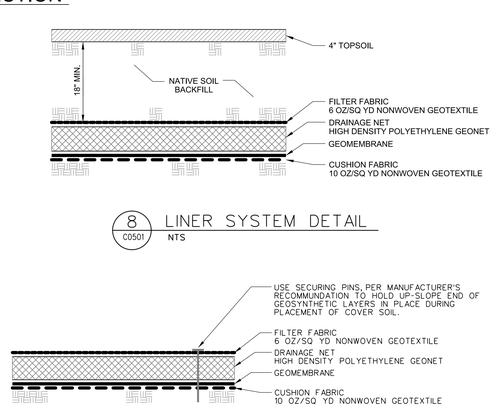
5 C0204 PHASE 3 SECTION
SCALE: 1" = 10'-0"



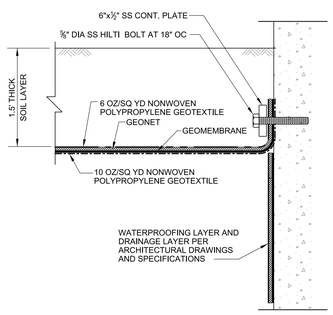
6 C0204 PHASE 3 SECTION
SCALE: 1" = 10'-0"



7 C0501 TYPICAL TUNNEL BACKFILL SECTION
NTS

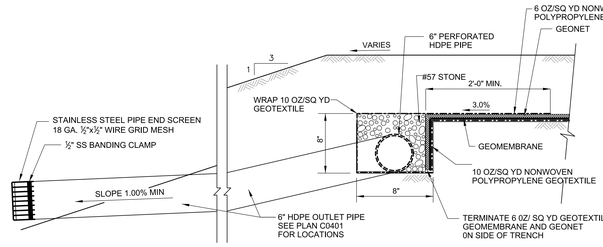


8 C0501 LINER SYSTEM DETAIL
NTS



9 C0501 WALL CONNECTION DETAIL
NTS

11 C0501 SECURING PIN DETAIL
NTS



10 C0501 HEADER PIPE AND OUTLET PIPE DETAIL
NTS

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

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0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE: BENJAMIN C. MCLEAN, REGISTERED PROFESSIONAL ENGINEER, AGRICOLOGIA, STATE OF TENNESSEE

REV.	DATE	DRAWING APPROVALS
		UTB

A/E DRAWING NUMBER: **C0501**

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PROJECT NAME: PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

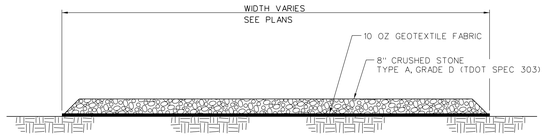
Site Sections

DSN	BCN
DRW	BSP
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	D	U

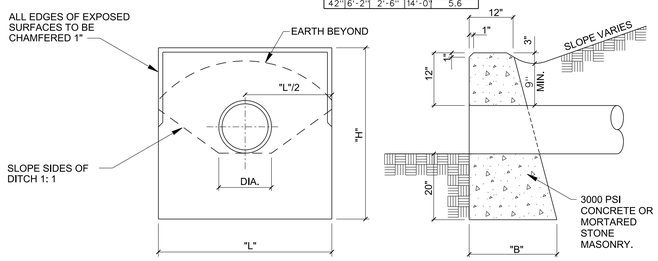
51	52	53	WBS	REV
NC	NA			0

STARTING POINT A



1 C0701 TYPICAL GRAVEL SECTION
NTS

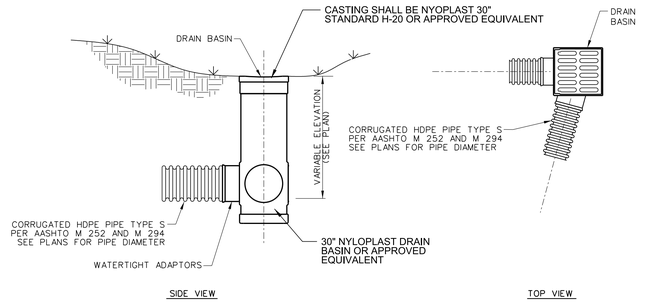
DIA.	"H"		"L"	CONC(CY)
12"	3'-8"	1'-11"	4'-0"	0.8
15"	3'-11"	1'-11½"	5'-0"	1.0
18"	4'-2"	2'-0½"	6'-0"	1.4
21"	4'-5"	2'-1¼"	7'-0"	1.8
24"	4'-8"	2'-2"	8'-0"	2.2
30"	5'-2"	2'-3½"	10'-0"	3.3
36"	5'-8"	2'-5"	12'-0"	4.3
42"	6'-2"	2'-6"	14'-0"	5.6



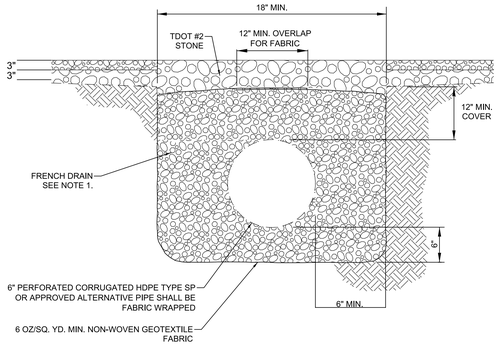
ELEVATION SECTION

2 C0701 STRAIGHT ENDWALL
NTS

3 C0701 NOT USED
NTS

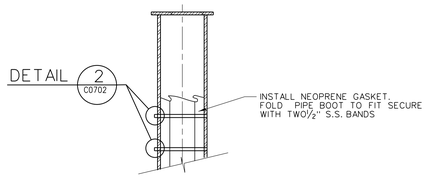


4 C0701 30" DRAIN BASIN TEMPORARY STORM DRAIN SYSTEM
NTS



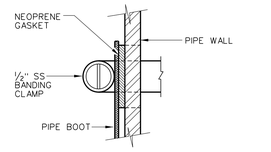
NOTES:
1. STONE SHALL BE TDOT NO. 57 STONE IN ACCORDANCE WITH AASHTO M-42.

5 C0701 FRENCH DRAIN SECTION
NTS

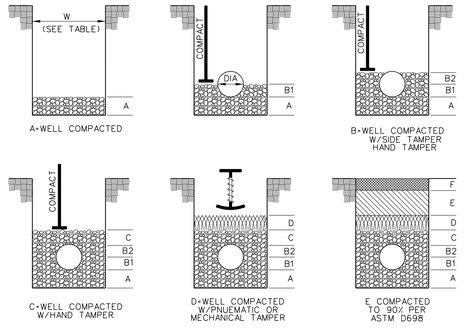


NOTE: PIPE BOOT SHALL BE THE SAME MATERIAL AS THE GEOMEMBRANE LINER.

6 C0701 12" DIA. PIPE BOOT DETAIL
NTS



7 C0701 BOOT ATTACHMENT DETAIL
NTS



NOTE:
1. PIPES UNDER PAVED AREAS WHERE DEPTH OF COVER IS 6 FEET OR LESS SHALL BE BACKFILLED WITH NO 57 CRUSHED STONE TO PAVEMENT SUBGRADE.

8 C0701 TRENCH, BEDDING & BACKFILL FOR HDPE PIPE
NTS

BEDDING AND BACKFILL FOR HDPE PIPE		
LAYER	DEPTH	MATERIAL
A	6"	NO. 57 CRUSHED STONE
B1	DIA/2	NO. 57 CRUSHED STONE
B2	DIA/2	NO. 57 CRUSHED STONE
C	12"	NO. 57 CRUSHED STONE
D	VARIES	SILT, SILTY CLAYS AND CLAYS, INCLUDING INORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY AND LIQUID LIMITS
E	VARIES	SILT, SILTY CLAYS AND CLAYS, INCLUDING INORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY AND LIQUID LIMITS
F	VARIES	TOPSOIL OR PAVEMENT

TRENCH WIDTH FOR HDPE PIPE		
DIAMETER	OUTSIDE DIA (IN)	W (IN)
4"	4.72	21
6"	6.95	23
8"	9.16	25
10"	11.31	28
12"	14.45	31
15"	17.65	34
18"	21.10	39
24"	28.30	48
30"	36.10	66
36"	42.25	78
42"	47.00	83
48"	53.00	89

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SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										
REVISION OR ISSUE PURPOSE									REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK									

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE		
DSN	BCN	
DRW	BSP	
CHK		
DEPT		
PE	COLLINS	
PJ	MARK CONNELL	
REQ	TBD	
REV.	DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
C0701

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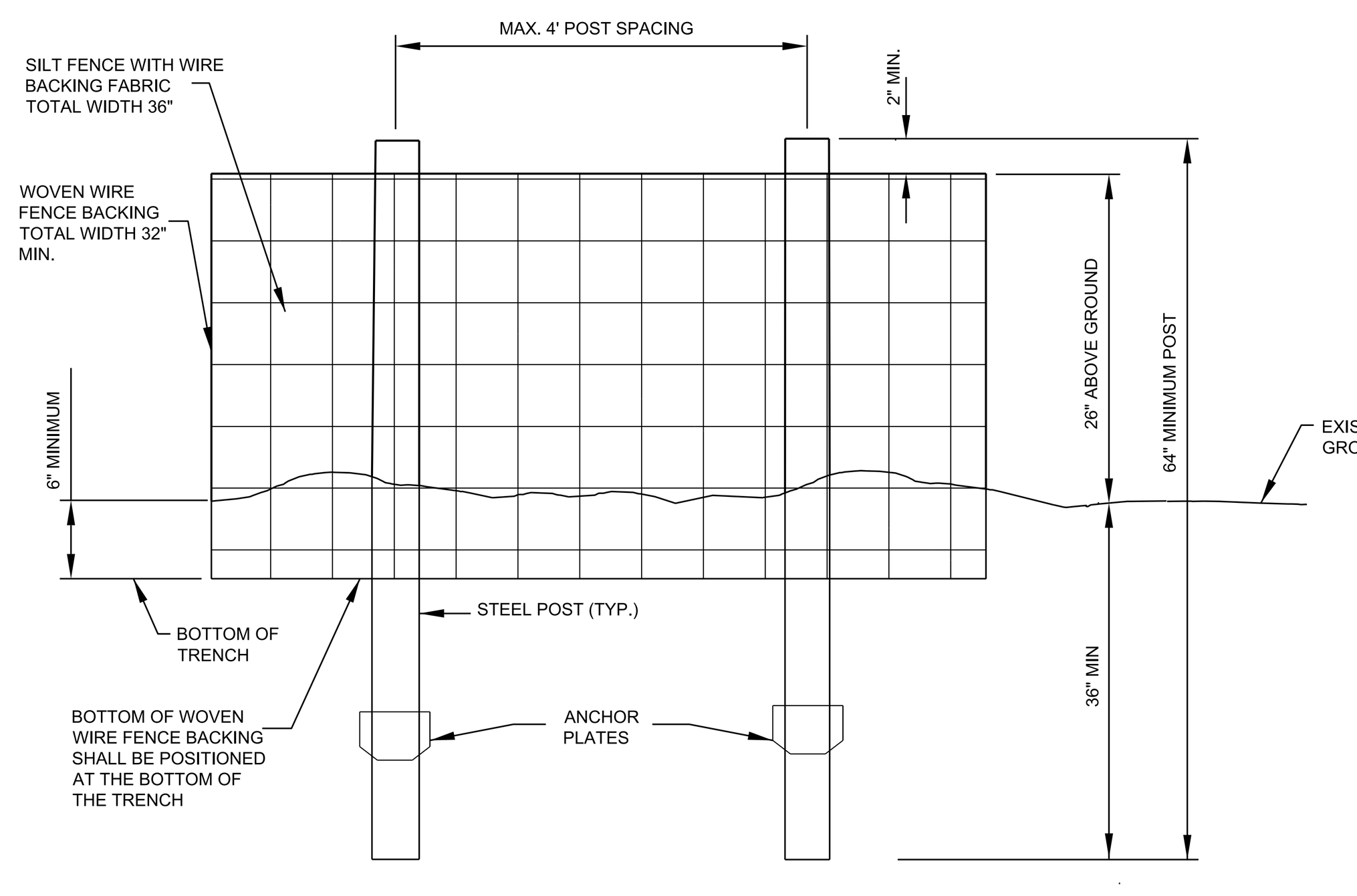
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-000R22725
UT-BATTELLE, LLC, © Oak Ridge, Tennessee

PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

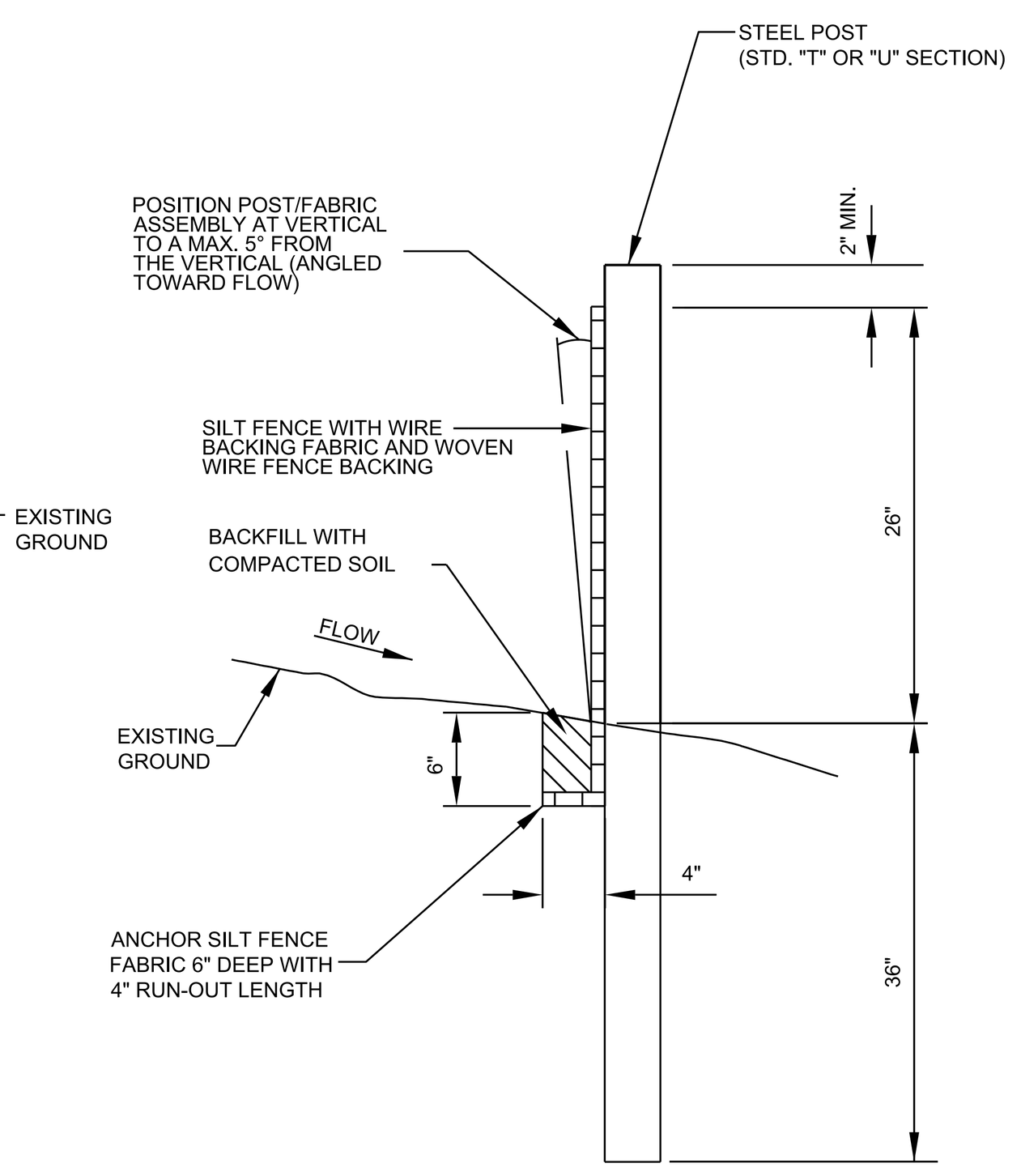
Site Details

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200		1	1	D	U
51		52		53	WBS					REV
NC		NA								0

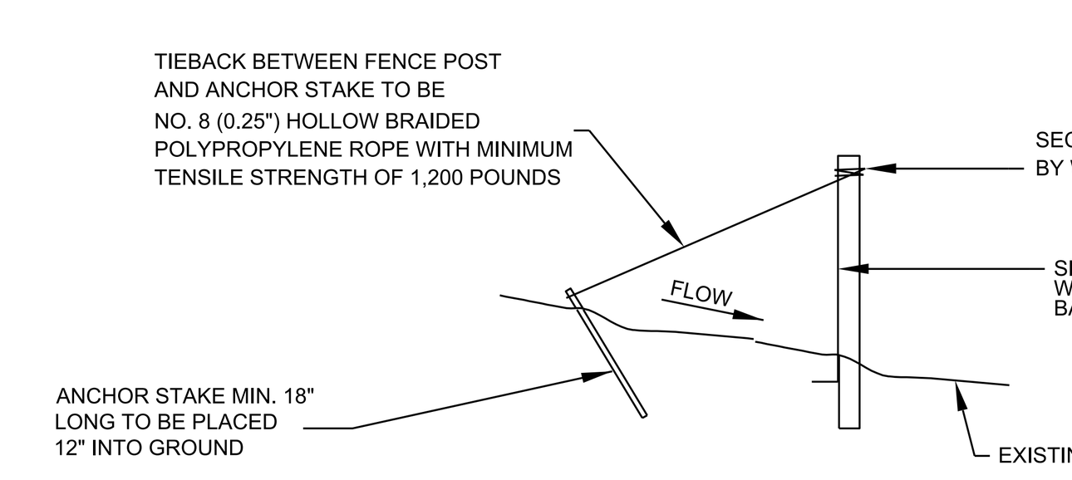
STARTING POINT A



ELEVATION VIEW



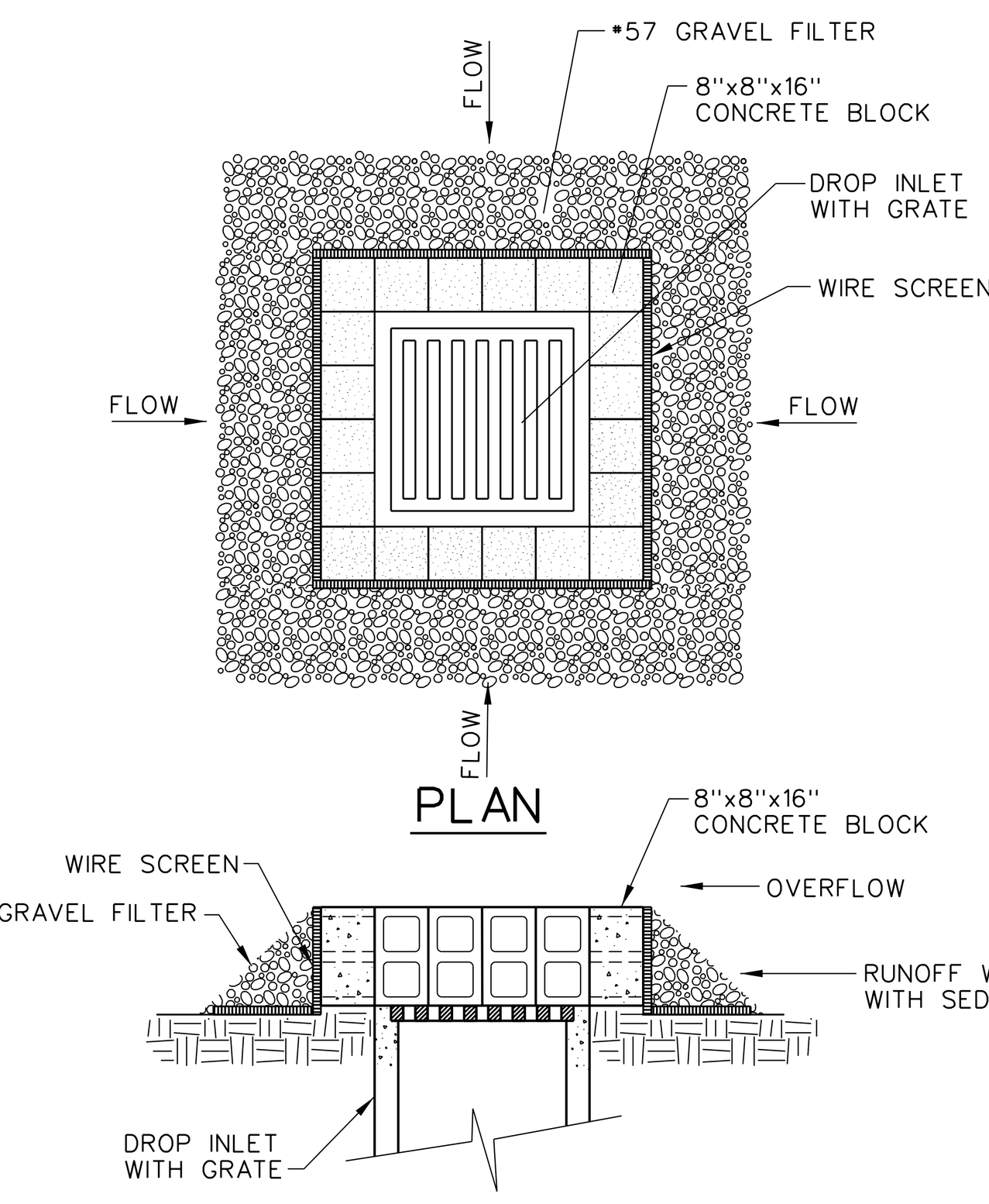
SECTIONAL VIEW



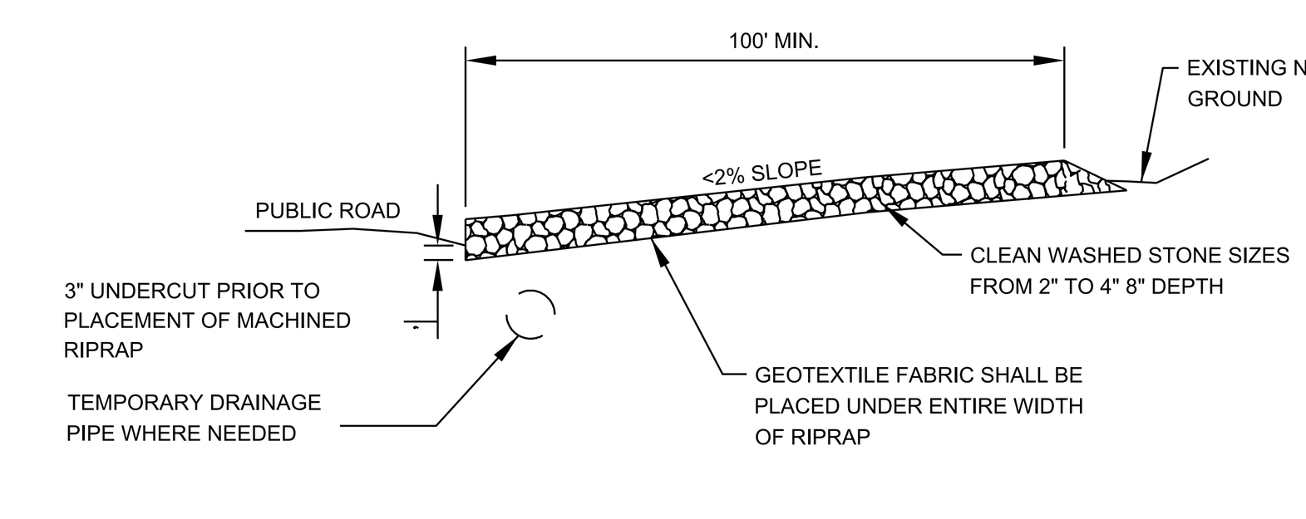
SILT FENCE TIEBACK FOR STEEL POSTS OR WOOD POSTS

(WHEN REQUIRED BY THE ENGINEER OR NOTED IN THE PLANS. COST TO BE INCLUDED IN THE ITEMS FOR SILT FENCE)

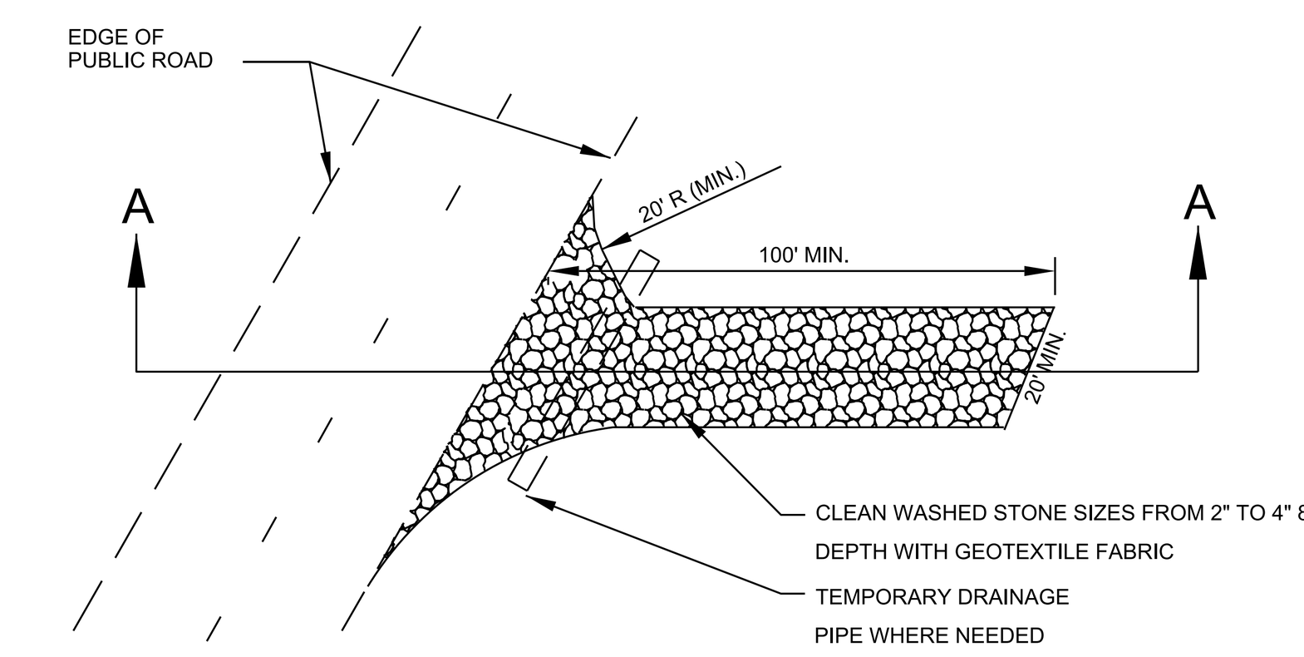
1 / C0702 SILT FENCE — NTS — SF



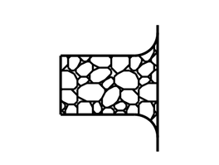
2 / C0702 BLOCK AND GRAVEL DROP INLET SEDIMENT FILTER DETAIL — NTS — IP



SECTION A-A

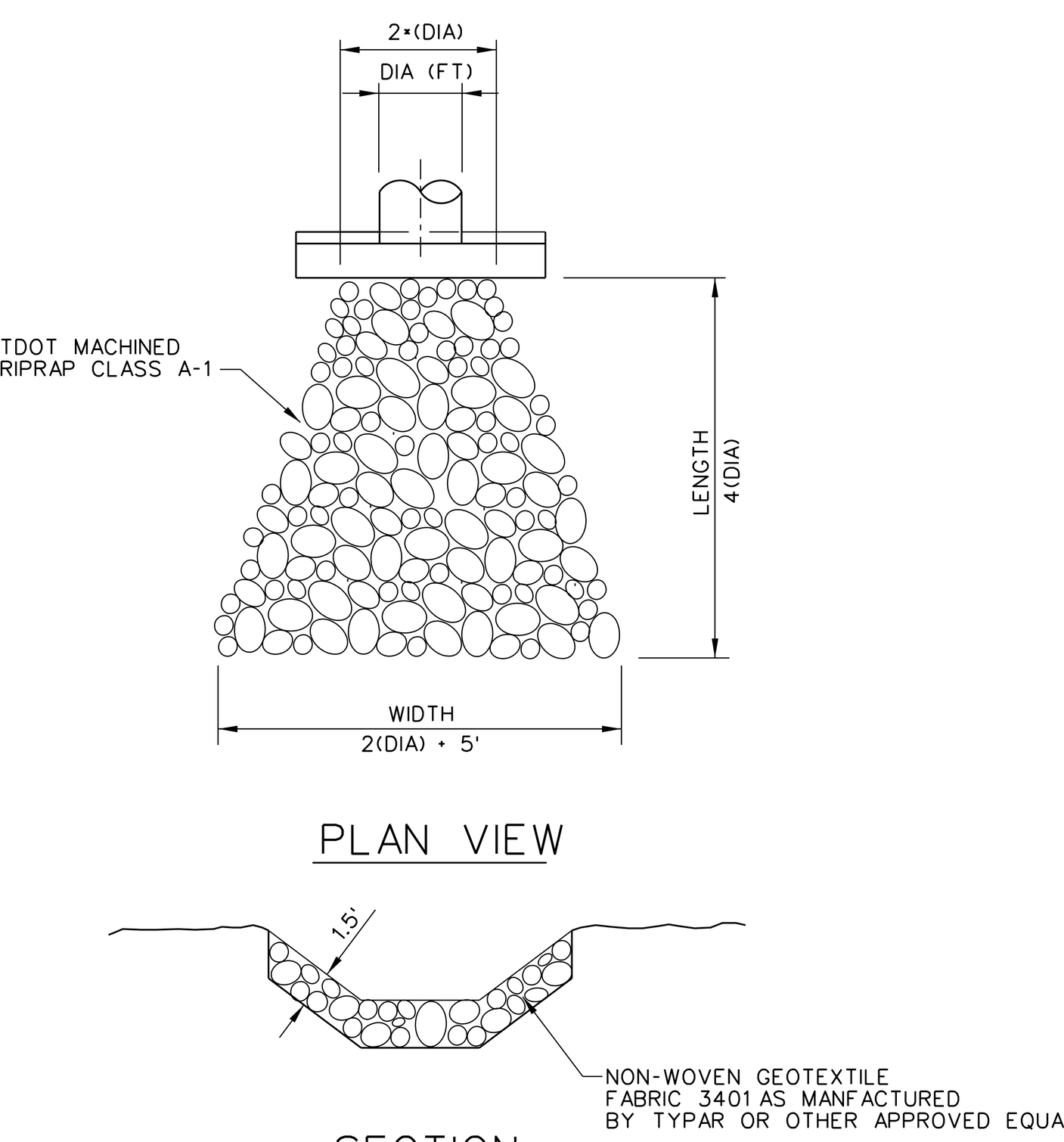


PLAN VIEW OF TEMPORARY CONSTRUCTION ROAD

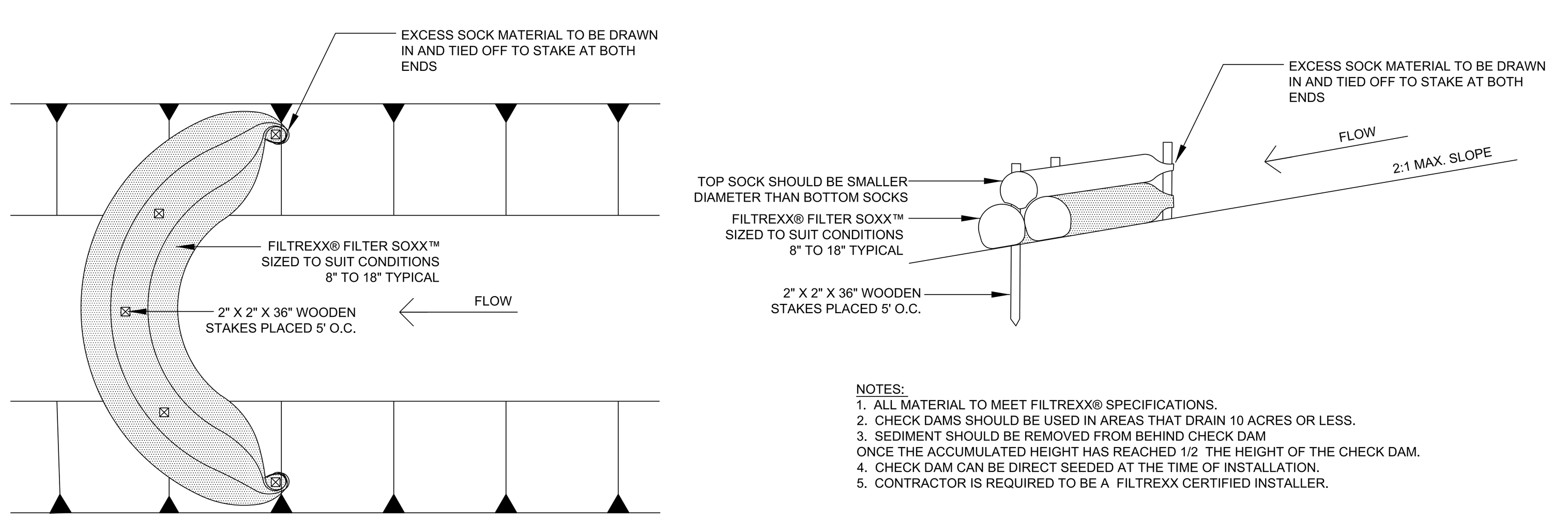


CONSTRUCTION EXIT

3 / C0702 CONSTRUCTION EXIT — NTS — CO

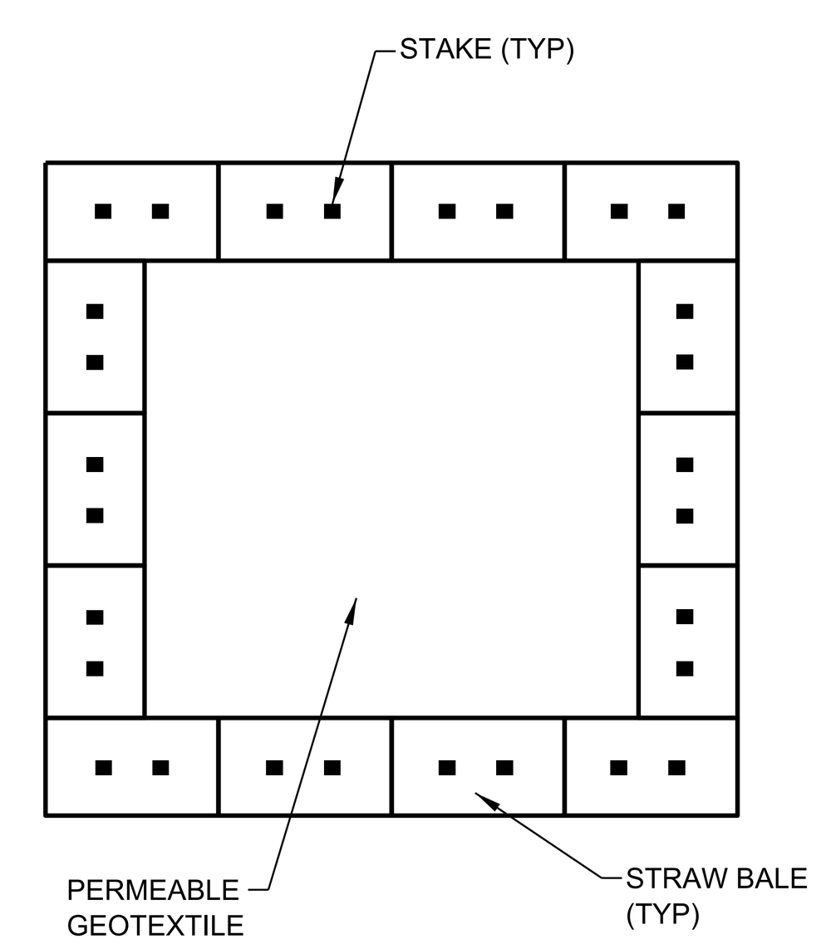


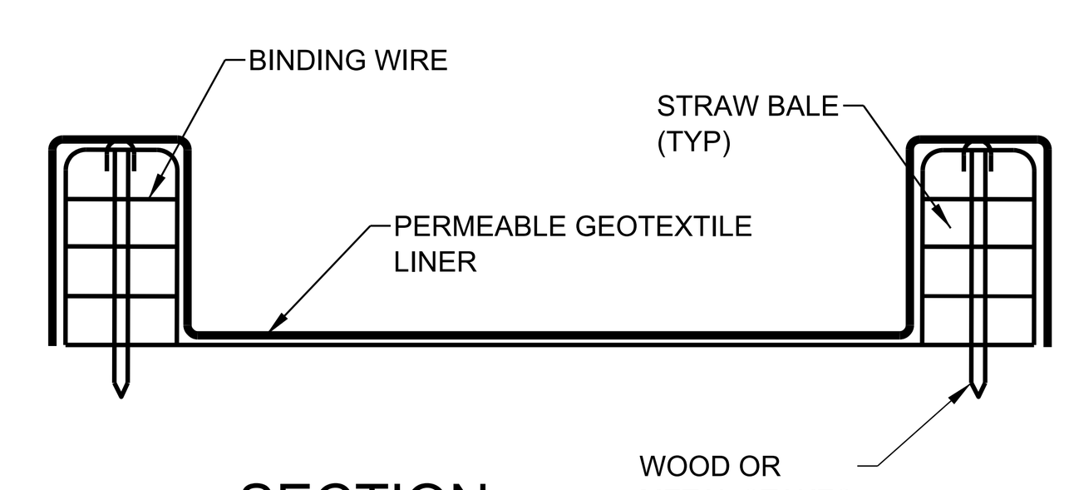
6 / C0702 RIP-RAP PROTECTION DETAIL — NTS — OP



NOTES:
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
2. CHECK DAMS SHOULD BE USED IN AREAS THAT DRAIN 10 ACRES OR LESS.
3. SEDIMENT SHOULD BE REMOVED FROM BEHIND CHECK DAM ONCE THE ACCUMULATED HEIGHT HAS REACHED 1/2 THE HEIGHT OF THE CHECK DAM.
4. CHECK DAM CAN BE DIRECT SEEDED AT THE TIME OF INSTALLATION.
5. CONTRACTOR IS REQUIRED TO BE A FILTREXX CERTIFIED INSTALLER.

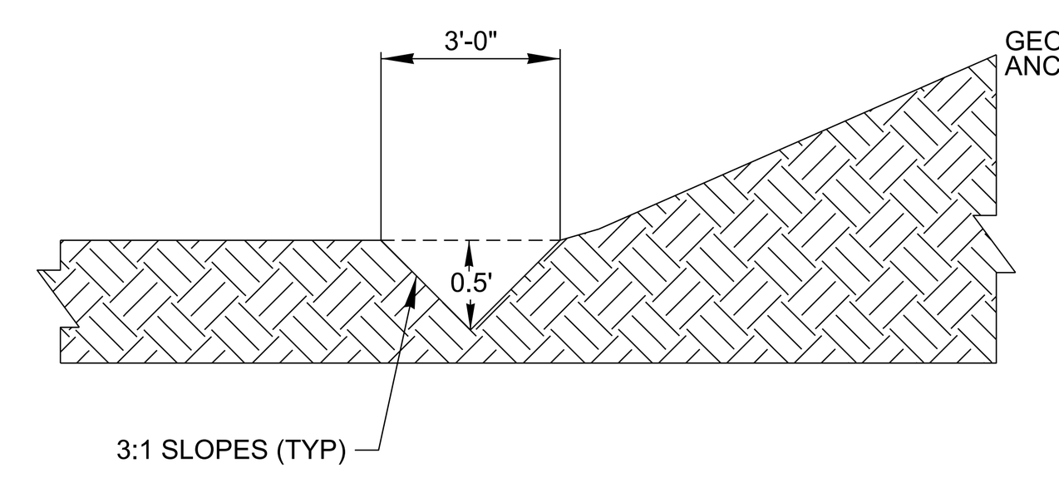
4 / C0702 FILTER RING — NTS — FR





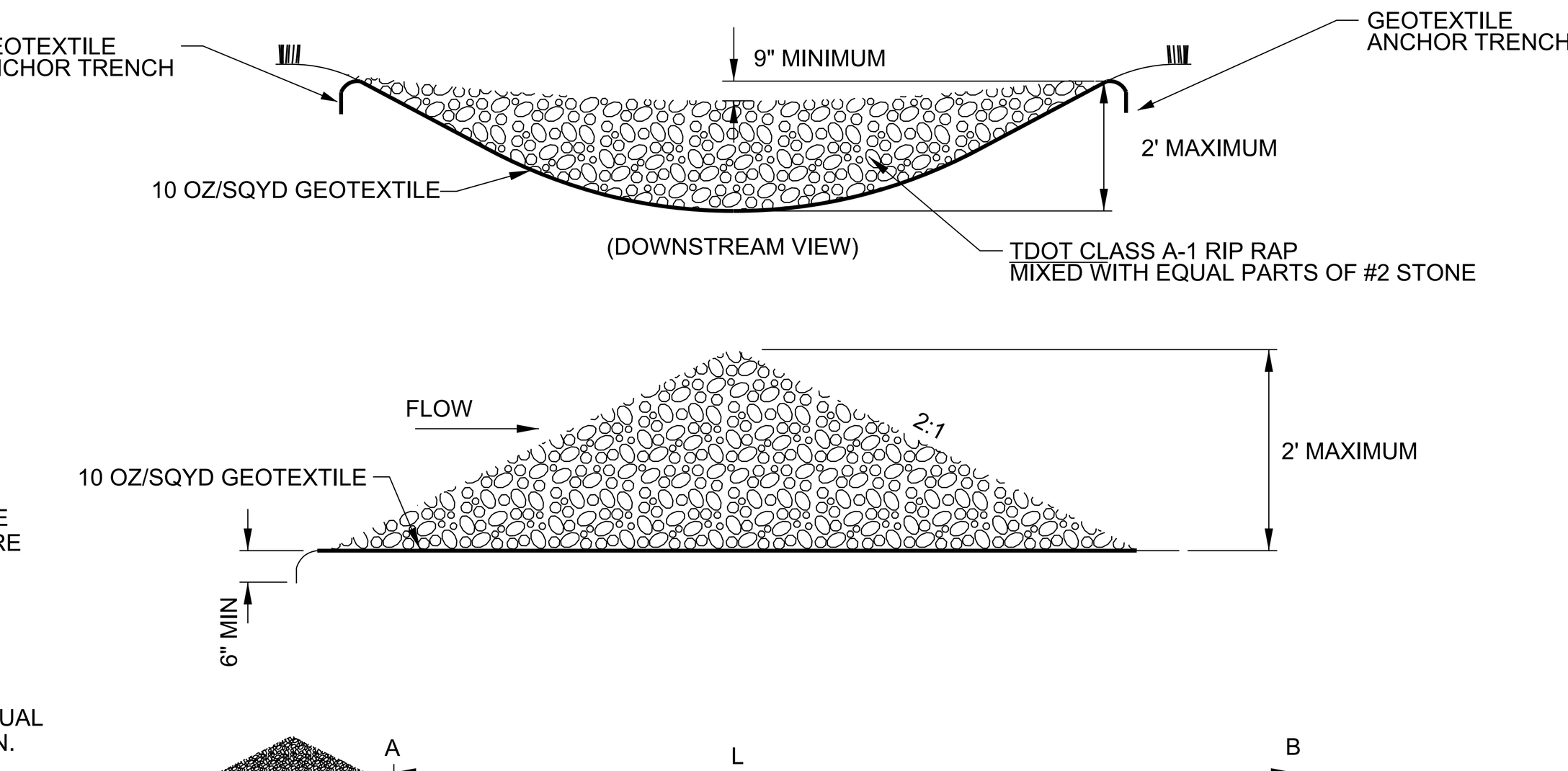
NOTES:
1. LOCATE CONCRETE WASHOUT A MINIMUM OF 50 FT AWAY FROM STORM DRAINS, OPEN DITCHES, AND WATERBODIES. FINAL LOCATION SHALL BE APPROVED BY COMPANY.
2. CONCRETE WASHOUT STRUCTURE SHALL BE SIZED TO HANDLE SOLIDS, WASH SLURRY, AND RAINFALL AND INCLUDE A MINIMUM OF 4" FREEBOARD.
3. THE STORAGE AREA SHALL BE LINED WITH A PERMEABLE GEOTEXTILE LINER TO ALLOW WATER TO INFILTRATE.

5 / C0702 CONCRETE WASHOUT — NTS



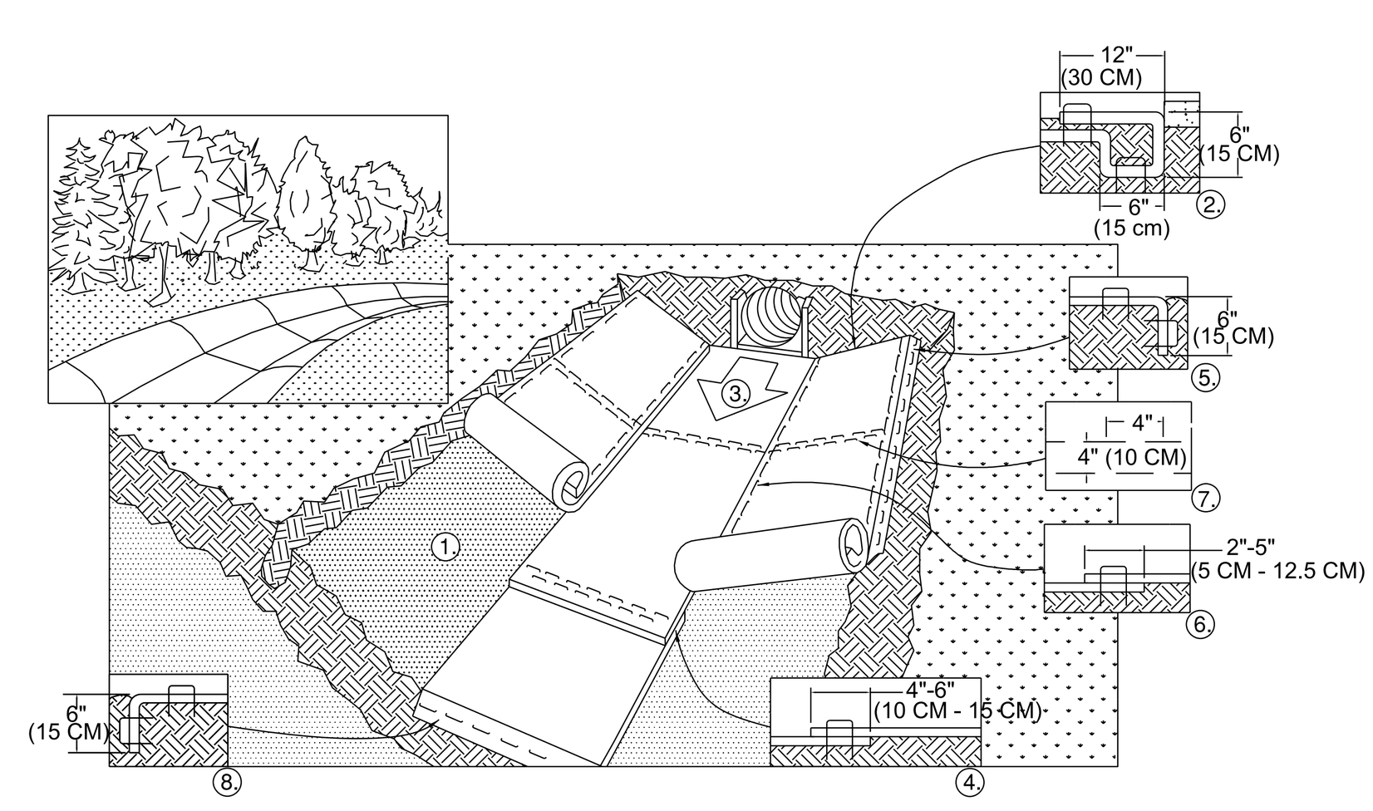
NOTES:
1. ALL TREES, BRUSH, STUMPS, OBSTRUCTIONS, AND OTHER OBJECTIONABLE MATERIAL SHALL BE REMOVED AND DISPOSED OF SO AS NOT TO INTERFERE WITH THE PROPER FUNCTIONING OF THE DIVERSION.
2. THE DIVERSION SHALL BE EXCAVATED OR SHAPED TO LINE, GRADE, AND CROSS SECTION AS DESIGNED TO MEET THE CRITERIA SPECIFIED HEREIN AND BE FREE OF IRREGULARITIES THAT WILL IMPEDE NORMAL FLOW.
3. ALL FILLS SHALL BE MACHINE COMPACTED AS NEEDED TO PREVENT UNEQUAL SETTLEMENT THAT WOULD CAUSE DAMAGE IN THE COMPLETED DIVERSION.
4. ALL EARTH REMOVED AND NOT NEEDED IN CONSTRUCTION SHALL BE SPREAD OR DISPOSED OF SO THAT IT WILL NOT INTERFERE WITH THE FUNCTIONING OF THE DIVERSION.
5. DIVERSION CHANNELS SHALL BE STABILIZED IN ACCORDANCE WITH DESIGNED PLANS AND SPECIFICATIONS.

8 / C0702 DIVERSION DITCH DETAIL — NTS — DI

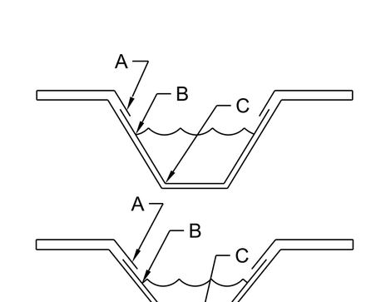


NOTE:
1. L=THE DISTANCE SUCH THAT POINTS A AND B ARE OF EQUAL ELEVATION

9 / C0702 CHECK DAM DETAIL — NTS — CD



NORTH AMERICAN GREEN



CRITICAL POINTS
A. OVERLAPS AND SEAMS
B. PROJECTED WATER LINE
C. CHANNEL BOTTOM/SIDE SLOPE VERTICES

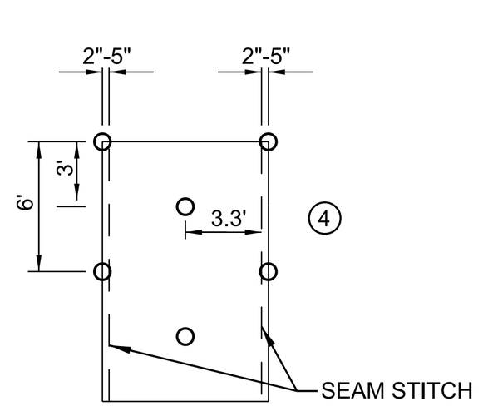
NOTE:
* HORIZONTAL STAPLE SPACING SHOULD BE ALTERED IF NECESSARY TO ALLOW STAPLES TO SECURE THE CRITICAL POINTS ALONG THE CHANNEL SURFACE.
** IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 cm) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. NOTE: WHEN USING CELL-O-SEED DO NOT SEED PREPARED AREA. CELL-O-SEED MUST BE INSTALLED WITH PAPER SIDE DOWN.
2. BEGIN AT THE TOP OF THE CHANNEL BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30 CM) OF BLANKET EXTENDED BEYOND THE UP- SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) ACROSS THE WIDTH OF THE BLANKET.
3. ROLL CENTER BLANKET IN DIRECTION OF WATER FLOW IN BOTTOM OF CHANNEL. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. TM WHEN USING THE DOT SYSTEM , STAPLES/STAKES SHOULD BE PLACED THROUGH EACH OF THE COLORED DOTS CORRESPONDING TO THE APPROPRIATE STAPLE PATTERN.
4. PLACE CONSECUTIVE BLANKETS END OVER END (SHINGLE STYLE) WITH A 4" - 6" (10 CM -15 CM) OVERLAP. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER TO SECURE BLANKETS.
5. FULL LENGTH EDGE OF BLANKETS AT TOP OF SIDE SLOPES MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.
6. ADJACENT BLANKETS MUST BE OVERLAPPED APPROXIMATELY 2" - 5" (5 CM -12.5 CM) (DEPENDING ON BLANKET TYPE) AND STAPLED.
7. IN HIGH FLOW CHANNEL APPLICATIONS, A STAPLE CHECK SLOT IS RECOMMENDED AT 30 TO 40 FOOT (9 M - 12 M) INTERVALS. USE A DOUBLE ROW OF STAPLES STAGGERED 4" (10 CM) APART AND 4" (10 CM) ON CENTER OVER ENTIRE WIDTH OF THE CHANNEL.
8. THE TERMINAL END OF THE BLANKETS MUST BE ANCHORED WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING.

NOTE:
* IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY ANCHOR THE BLANKETS.

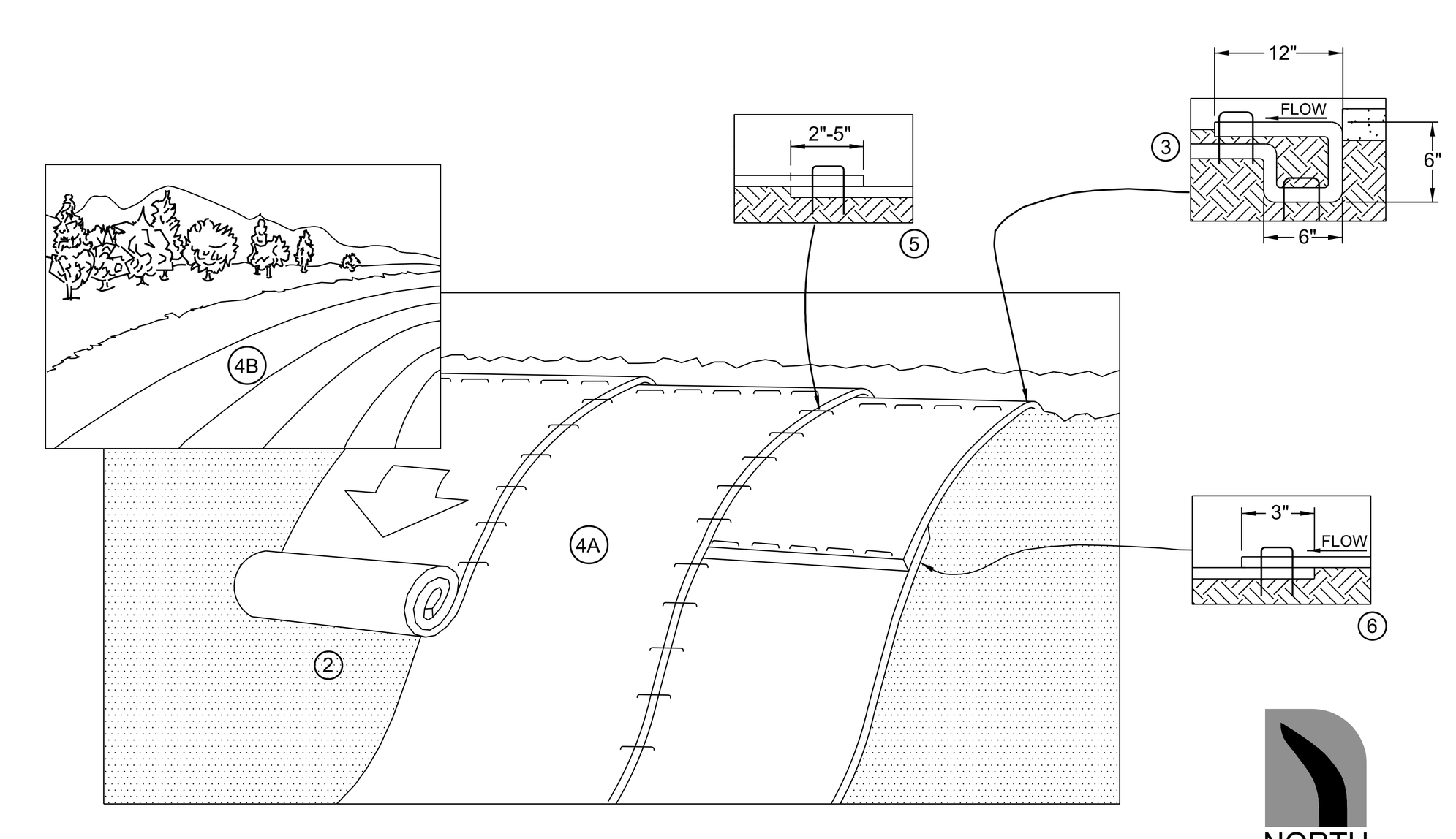
CHANNEL INSTALLATION

USE NORTH AMERICAN GREEN C350 OR EQUIVALENT FOR DRAINAGE CHANNELS



1. 0.7 STAPLES PER SQ. YD.
2. STAPLES SHALL BE 6" 11GA. WIRE, "U" SHAPED STAPLES. LARGER STAPLES MAY BE REQUIRED FOR LOOSE SOIL. HEAVIER GAUGE STAPLES MAY BE REQUIRED FOR ROCKY OR HEAVILY COMPACTED SOIL.
3. FOR BLANKETS WITH THE OPTIONAL NORTH AMERICAN GREEN DOT SYSTEM, PLACE STAPLES/STAKES THROUGH EACH OF THE BLUE COLORED DOTS.

STAPLE PATTERN GUIDE



NORTH AMERICAN GREEN

1. BLANKET SHALL BE NORTH AMERICAN GREEN SC150BN OR APPROVED SUBSTITUTION, INSTALLED TO MANUFACTURER RECOMMENDATIONS.
2. PREPARE SOIL BEFORE INSTALLING BLANKETS. REFER TO PROJECT SPECIFICATIONS FOR SEEDING REQUIREMENTS. CONTRACTOR SHALL WATER SEED TO ENSURE GERMINATION AND ATTAIN A STAND OF GRASS ACCEPTABLE TO THE OWNER AND ENGINEER.
3. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP- SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES OR STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.
4. ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE. WHEN USING THE DOT SYSTEM, STAPLES OR STAKES SHOULD BE PLACED THROUGH THE BLUE DOTS.
5. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" OVERLAP.
6. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" APART ACROSS ENTIRE BLANKET WIDTH.

SLOPE INSTALLATION

USE NORTH AMERICAN GREEN SC150BN OR EQUIVALENT FOR SLOPES

7 / C0702 TEMPORARY MATTING DETAIL — NTS — MA

TEMPORARY SEED MIXTURE

SPECIES	SEEDING RATE/ACRE	PLANTING TIME	DESIRED pH RANGE	FERTILIZATION RATE/ACRE	ESTABLISHMENT METHOD	ZONE OF ADAPTABILITY
WHEAT	90 LBS. ALONE	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL
RYEGRASS	30 LBS.	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL
WHITE CLOVER	5 LBS.	9/1 - 11/30	6.0 - 7.0	400 LBS. 13-13-13	SEED	ALL
CRIMSON CLOVER	25 LBS. ALONE 15 LBS. MIX	9/1 - 11/30	6.0 - 7.0	400 LBS. 13-13-13	SEED	ALL
HAIRY VETCH	30 LBS.	9/1 - 11/30	6.0 - 7.0	400 LBS. 13-13-13	SEED	ALL
BROWNTOP MILLET	40 LBS. ALONE 15 LBS. MIX	4/1 - 8/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL

TEMPORARY SEEDING

PERMANENT SEED MIXTURE

SPECIES	SEEDING RATE/ACRE	PLANTING TIME	DESIRED pH RANGE	FERTILIZATION RATE/ACRE	ESTABLISHMENT METHOD	ZONE OF ADAPTABILITY	NATIVE / INTRODUCED
COMMON BERMUDA	15 LBS. ALONE 10 LBS. MIX	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED OR SOD	ALL	INTRODUCED *POTENTIAL FOR INVASIVENESS
BAHIA	40 LBS. ALONE 30 LBS. MIX	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	CENTRAL AND SOUTH	INTRODUCED
FESCUE	40 LBS. ALONE 30 LBS. MIX	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	NORTH AND CENTRAL	NATIVE
SAINT AUGUSTINE	- - - -	3/1 - 7/15	6.0 - 7.0	600 LBS. 13-13-13	SOD ONLY	CENTRAL AND SOUTH	NATIVE
CENTIPEDE	4 LBS. ALONE 2.5 LBS. MIX	3/1 - 7/15	6.0 - 7.0	600 LBS. 13-13-13	SEED OR SOD	ALL	INTRODUCED
CARPET GRASS	15 LBS. ALONE 10 LBS. MIX	3/1 - 7/15	6.0 - 7.0	600 LBS. 13-13-13	SEED OR SOD	ALL	NATIVE
ZOYSIA GRASS	- - - -	3/1 - 7/15	6.0 - 7.0	600 LBS. 13-13-13	SOD ONLY	ALL	INTRODUCED
CREEPING RED FESCUE	30 LBS. ALONE 22.5 LBS. MIX	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL	NATIVE
WEEPING LOVEGRASS	10 LBS. ALONE 5 LBS. MIX	3/1 - 7/15	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL	INTRODUCED
*WHEAT	90 LBS. ALONE	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL	NATIVE
*RYEGRASS	30 LBS.	9/1 - 11/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL	NATIVE
*WHITE CLOVER	5 LBS.	9/1 - 11/30	6.0 - 7.0	400 LBS. 6-24-24	SEED	ALL	INTRODUCED
*CRIMSON CLOVER	15 LBS.	9/1 - 11/30	6.0 - 7.0	400 LBS. 6-24-24	SEED	ALL	INTRODUCED
SERICEA LESPEDEZA	40 LBS.	3/1 - 7/15 9/1 - 11/30	6.0 - 7.0	400 LBS. 13-13-13	SEED	ALL	INTRODUCED
*HAIRY VETCH	30 LBS.	9/1 - 11/30	6.0 - 7.0	400 LBS. 6-24-24	SEED	ALL	INTRODUCED
*BROWNTOP MILLET	10 LBS. ALONE 5 LBS. MIX	4/1 - 8/30	6.0 - 7.0	600 LBS. 13-13-13	SEED	ALL	INTRODUCED

* NOTE ON ANNUALS: FOR PERMANENT SEEDING, ANNUALS CAN ONLY BE USED IN A MIXTURE WITH PERENNIALS.

PERMANENT SEEDING

10 / C0702 SEEDING SCHEDULE — NTS — PS — TS

BARGE DESIGN SOLUTIONS
1110 Market Street // Suite 200 // Chattanooga, Tennessee 37402
PHONE (423) 756-3025 // FAX (423) 756-8477

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Los Angeles ▪Mumbai ▪New York ▪Phoenix ▪San Francisco ▪Shanghai
Toronto ▪Vancouver ▪Victoria ▪Washington DC

NUMBER OF SECTION OR DETAIL — DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

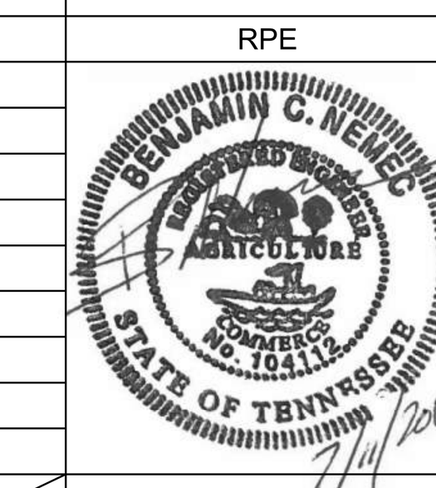
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE — REVISION OR ISSUE REVIEWERS — INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019



RPE
DSN BCN
DRW BSP
CHK
DEPT
PE COLLINS
PJ MARK CONNELL
REQ TBD
UTB
REV. DATE
DRAWING APPROVALS

A/E DRAWING NUMBER
C0702

UT-BATTELLE
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725
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PROJECT NAME:
PPU-RTBT STUB PRELIMINARY AND FINAL DESIGN

Site Details

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	C	X	X	8	8200	13	1	1		U

51	52	53	WBS	REV
NC	NA		C3E021655A010	0

NEXT ASSY: FINAL ASSY:

ABBREVIATIONS

ADDL	ADDITIONAL
ADJ	ADJACENT
ALT	ALTERNATE
ALUM	ALUMINUM
APPROX	APPROXIMATE
AR	ANCHOR ROD
ARCH	ARCHITECTURAL
B.PL	BASE PLATE
B/	BOTTOM OF
BFR	BLENDED FIBER REINFORCING
BLDG	BUILDING
BLKG	BLOCK (ING)
BOT	BOTTOM
BRG	BEARING
BSMT	BASEMENT
BTWN	BETWEEN
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTER LINE
CLR	CLEAR
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECT (ION)
CONST JT	CONSTRUCTION JOINT
CONT	CONTINUOUS OR CONTINUE
COORD	COORDINATE
CS	COLUMN STRIP
CU YD	CUBIC YARD
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DL	DEAD LOAD
DWG	DRAWING
EA	EACH
EE	EACH END
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
ELEC	ELECTRICAL
ELEV	ELEVATOR
EOBP	EDGE OF BENT PLATE
EOD	EDGE OF DECK
EOP	EDGE OF PLATE
EOS	EDGE OF SLAB
EQ	EQUAL
ES	EACH SIDE
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FLR	FLOOR
FP	FULL PENETRATION
FS	FAR SIDE
FT	FOOT/FEET
FTG	FOOTING
GA	GAGE
GALV	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
HORIZ	HORIZONTAL
HP	HIGH POINT
HS	HIGH STRENGTH
HSS SECTION	HOLLOW STRUCTURAL
HT	HEIGHT
ID	INSIDE DIAMETER
IF	INSIDE FACE
INFO	INFORMATION
INSUL	INSULATED (ION)
INV	INVERT
JT	JOINT
k	KIPS
L	ANGLE
LBS	POUNDS
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LP	LOW POINT
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
LTWT	LIGHT WEIGHT
LW	LONG WAY
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEP	MECHANICAL ELECTRICAL & PLUMBING
MFR	MANUFACTURER
MIN	MINIMUM
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MS	MIDDLE STRIP
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OPNG	OPENING
PC	PILE CAP
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PEN	PENETRATION
PL	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST TENSION
QTY	QUANTITY
R	RADIUS
RD	ROOF DRAIN
REF	REFERENCE
REINF	REINFORCE (D) (ING)
REQD	REQUIRED
REV	REVISION
RO	ROUGH OPENING
SC	SLIP CRITICAL
SECT	SECTION
SIM	SIMILAR
SJ	SEISMIC JOINT
SOG	SLAB ON GROUND
SPEC	SPECIFICATIONS
SQ	SQUARE
SST	STAINLESS STEEL
STBC	STRU THERMAL BREAK CONN
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUCT	STRUCTURAL
SW	SHORT WAY
SYMM	SYMMETRICAL
T/	TOP OF
T&B	TOP AND BOTTOM
THK	THICK (NESS)
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
VIF	VERIFY IN FIELD
W	WIDE FLANGE SECTION
W/	WITH
W/O	WITHOUT
WD	WOOD
WP	WORK POINT
WT	TEE SECTION
WWR REINFORCEMENT	WELDED WIRE

FOUNDATION NOTES

F1
REFER TO DIVISION 31 SPECIFICATION SECTIONS FOR REQUIREMENTS IN ADDITION TO THOSE LISTED BELOW.

F2
NOTE REQUIREMENTS ON PLANS AND IN SPECIFICATIONS FOR UNDERPINNING AND PROTECTION OF EXISTING STRUCTURES. DO NOT UNDERMINE EXISTING CONSTRUCTION.

F3
BEAR FOOTINGS ON PREPARED SUBGRADE ON TOP OF UNDISTURBED SOILS OR ENGINEERED FILL HAVING SUFFICIENT BEARING CAPACITY TO SUPPORT THE WEIGHT OF THE TUNNEL AND SOIL ABOVE. GEOTECHNICAL ENGINEER SHALL CONFIRM PREPARED SUBGRADE HAS SUFFICIENT BEARING CAPACITY TO SUPPORT THESE LOADS PRIOR TO CONSTRUCTION OF THE TUNNEL.

F4
THE FOUNDATIONS HAVE BEEN DESIGNED TO THE REQUIREMENTS SET FORTH IN THE GEOTECHNICAL REPORT PREPARED BY SHIELD ENGINEERING, INC., DATED MARCH 1, 2019. PROJECT NUMBER 1195002-01.

F5
THE SUBSURFACE CONDITIONS DESCRIBED IN THE GEOTECHNICAL REPORT REPRESENT CONDITIONS ONLY AT THOSE SPECIFIC LOCATIONS AT THE PARTICULAR TIME THEY WERE MADE. SUBSURFACE CONDITIONS DESCRIBED ON THE DRAWINGS SHOULD BE CONSIDERED APPROXIMATE.

F6
OVEREXCAVATE TUNNEL FOUNDATION TO A DEPTH OF 2 FEET BELOW DESIGN BEARING ELEVATION. BACKFILL WITH FOUNDATION SUBGRADE CONSISTING OF 1'-6" OF COMPACTED DENSE GRADED STONE AND TOPPED WITH 6 INCHES OF ASTM #57 STONE.

F7
REMOVE ORGANIC AND UNSUITABLE MATERIAL, AS DETERMINED BY THE COMPANIES GEOTECHNICAL CONSULTANT, PRIOR TO PLACING FILL AND REPLACE W/ ENGINEERED FILL. PLACE FILL IN HORIZONTAL LAYERS WITHIN +/- 2 PERCENT OF OPTIMUM MOISTURE CONTENT. USE FILL LAYER THICKNESS APPROPRIATE FOR THE DEGREE OF FILL COHESIVENESS AND COMPACTION ENERGY IMPARTED TO THE LIFT. COMPACT TO SPECIFIED DENSITY REQUIREMENTS. IF ACCEPTABLE TO THE COMPANIES GEOTECHNICAL CONSULTANT, ON-SITE MATERIALS THAT MEET PROJECT SPECIFICATIONS MAY BE USED FOR ENGINEERED FILL IF MAINTAINED AT OPTIMUM MOISTURE CONTENT AND COMPACTED TO THE ABOVE CRITERIA. SELECT BORROW MATERIALS WILL BE REQUIRED WHEN ON-SITE MATERIALS ARE UNSUITABLE OR CANNOT BE COMPACTED TO THE CRITERIA STATED ABOVE.

F8
EXCAVATION TO SUITABLE BEARING SUBGRADES MAY PROCEED BY CONVENTIONAL METHODS TO WITHIN 2.5 FEET OF THE PROPOSED FINAL SUBGRADES. PERFORM EXCAVATION TO FINAL SUBGRADE USING A BACKHOE EQUIPPED WITH A SMOOTH BLADE TO MINIMIZE DISTURBANCE OF THE BEARING SUBGRADE. FINISH FOOTING EXCAVATIONS BY HAND.

F9
DO NOT EXTEND THE GENERAL EXCAVATION ACROSS THE SITE DEEPER THAN 1'-0" BELOW THE SLAB ON GROUND SUBGRADE ELEVATION. PERFORM THE EXCAVATIONS FOR PILE CAPS, DRILLED PIER CAPS, GRADE BEAMS, SPREAD FOOTINGS, MATS, PITS, ETC ON AN INDIVIDUAL, LOCALIZED BASIS DOWN FROM THE SLAB ON GROUND SUBGRADE ELEVATION.

F10
PROVIDE POSITIVE PROTECTION FOR EXCAVATION SLOPES AGAINST INSTABILITY AND DETERIORATION DUE TO RAIN, WIND, SNOW OR ICE.

F11
RETAIN THE PERIMETER OF THE GENERAL EXCAVATION WITH A SOIL RETENTION SYSTEM AS NECESSARY. THE DESIGN, INSTALLATION, MAINTENANCE AND REMOVAL OF THE SYSTEM IS THE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE APPROPRIATE MEASURES AND PRECAUTIONS NECESSARY TO MINIMIZE SETTLEMENT OF EXISTING OR NEW CONSTRUCTION INSIDE OR OUTSIDE OF THE PROJECT LIMITS. REPAIR DAMAGE TO NEW OR EXISTING CONSTRUCTION INSIDE OR OUTSIDE PROJECT LIMITS CAUSED BY CONSTRUCTION TECHNIQUES OR MOVEMENTS OF THE SOIL RETENTION SYSTEM.

F12
THE EXPOSED SUBGRADE SOILS MAY BE SENSITIVE TO DISTURBANCE AND STRENGTH DEGRADATION WHEN HIGH MOISTURE CONTENTS ARE PRESENT. MINIMIZE CONSTRUCTION TRAFFIC OVER EXPOSED SUBGRADES. DO NOT POND WATER ON THE SUBGRADES. CONTROL SURFACE AND GROUND WATER BY PROPER SITE GRADING, PERIMETER CUTOFF TRENCHES, AND SUMP AND PUMP METHODS OF DEWATERING. CONSTRUCT CUTOFF TRENCHES AND SUMPS OUTSIDE THE INFLUENCE OF PROPOSED FOUNDATIONS.

F13
THE COMPANIES GEOTECHNICAL CONSULTANT MUST REVIEW AND APPROVE FINISHED EXCAVATIONS AND BEARING SUBGRADES BEFORE PLACING CONCRETE. PROVIDE ADDITIONAL EXCAVATION AS NECESSARY TO ACHIEVE THE REQUIRED BEARING CAPACITY.

F14
DO NOT LEAVE BEARING SOILS EXPOSED OVERNIGHT OR DURING INCLEMENT WEATHER.

F15
USE SIDE FORMS FOR FOOTINGS AND GRADE BEAMS. CLEAN REINFORCEMENT PER SPECIFICATION IMMEDIATELY PRIOR TO PLACING CONCRETE.

F16
DO NOT PLACE CONCRETE IN AN EXCAVATION CONTAINING FREE WATER, FROST, ICE OR FROZEN GROUND. PROVIDE NECESSARY MEASURES TO PREVENT FROST OR ICE FROM PENETRATING FOOTING OR SLAB SUBGRADE, BOTH BEFORE AND AFTER CONCRETE PLACEMENT AND UNTIL SUBGRADES ARE FULLY PROTECTED BY THE PERMANENT BUILDING STRUCTURE.

F17
LIMIT FOOTING, SLAB, AND WALL POUR LENGTHS TO 60 FEET (+/-).

F18
DO NOT BACKFILL AGAINST TUNNEL WALLS UNTIL THE SLABS AT THE TOP AND BOTTOM OF THE WALL HAVE BEEN PLACED AND THE CONCRETE HAS ATTAINED FULL DESIGN STRENGTH. PLACE BACKFILL AGAINST TUNNEL WALLS TO MAINTAIN A FILL LEVEL WITHIN 2'-0" OR LESS ON OPPOSITE SIDES OF THE WALL.

STRUCTURAL CONCRETE NOTES

C1
REFER TO DIVISION 03 SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO THOSE LISTED BELOW.

C2
A QUALITY CONTROL PROGRAM OF FIELD TESTING AND INSPECTION WILL BE PERFORMED ON STRUCTURAL CONCRETE WORK IN ACCORDANCE WITH THE SPECIFICATIONS. SCHEDULE WORK AND PROVIDE ACCESS TO ALLOW THE TESTING REQUIREMENTS TO BE COMPLETED. PROVIDE ADEQUATE NOTICE TO ALLOW THE COMPANIES TESTING AGENCY TO REVIEW PLACEMENT OF REINFORCEMENT PRIOR TO PLACING CONCRETE.

C3
SUBMIT ENGINEERED CONCRETE MIX DESIGNS, INCLUDING REQUIRED BACKUP DATA, FOR EACH TYPE OF CONCRETE PROPOSED FOR USE TO THE COMPANY FOR REVIEW. ALLOW ADEQUATE TIME FOR REVIEW PRIOR TO PERFORMING CONCRETE WORK.

C4
DETAIL, FABRICATE, LABEL, SUPPORT AND PLACE CONCRETE REINFORCEMENT IN ACCORDANCE WITH ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND ACI 318 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE", LATEST EDITIONS.

C5
SUBMIT DETAILED SHOP DRAWINGS INDICATING REINFORCEMENT SIZE, SPACING AND PLACEMENT TO THE COMPANY FOR REVIEW PRIOR TO FABRICATION. INCLUDE DETAILS AND LOCATIONS OF CURBS, CONSTRUCTION JOINTS, SLAB DEPRESSIONS, SLEEVES, OPENINGS, ETC.

C6
SAWCUT SLABS ON GROUND IN THE PATTERN SHOWN ON PLAN. START SAWCUTTING AS SOON AS THE SAW WILL NOT RAVEL EDGES OR DISLODGE AGGREGATE, BUT IN NO CASE MORE THAN 12 HOURS AFTER THE SLAB IS PLACED.

C7
COORDINATE LOCATION OF CONSTRUCTION JOINTS WITH THE COMPANY PRIOR TO COMMENCEMENT OF CONCRETE WORK. STAGGER JOINTS BETWEEN FLOORS, WALLS, AND ROOFS, RESPECTIVELY, A MINIMUM OF 4'-0".

C8
CLEAN AND MOISTEN CONSTRUCTION JOINTS IMMEDIATELY PRIOR TO PLACING FRESH CONCRETE.

C9
COORDINATE THE LOCATION OF INSERTS, EMBEDDED PLATES, ANCHORS, REGLETS AND SIMILAR ITEMS REQUIRED BY OTHER TRADES TO BE PLACED IN CONCRETE. MAINTAIN CORRECT LOCATION OF REINFORCING BARS WHEN PLACING THESE ITEMS.

C10
UNLESS NOTED OTHERWISE, PROVIDE DOWELS TO MATCH MAIN REINFORCEMENT SIZE AND SPACING. PROVIDE TENSION LAP SPLICE UNLESS NOTED OTHERWISE.

C11
DO NOT USE CALCIUM CHLORIDE IN CONCRETE.

C12
REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS FOR CURBS, PADS, DEPRESSIONS, WALL/SLAB OPENINGS, SPECIAL FLOOR FINISHES, ETC.

C14
PROVIDE AIR-ENTRAINING IN CONCRETE AS SET FORTH IN THE SPECIFICATIONS.

C15
PROVIDE ONLY THOSE OPENINGS INDICATED ON THE REVIEWED SHOP DRAWINGS.

C16
REFER TO ACI 305 FOR REQUIREMENTS FOR PLACING CONCRETE IN HOT WEATHER AND TO ACI 306 FOR REQUIREMENTS FOR PLACING CONCRETE IN COLD WEATHER.

C17
PROVIDE ONLY CONCRETE AND REINFORCING MATERIALS OF THE TYPES AND GRADES LISTED IN THE TABLE BELOW, UNLESS NOTED OTHERWISE.

CONCRETE	**FC (PSI)**	**DENSITY (PCF)**
FOOTINGS	4000	150
WALLS	4000	150
ELEVATED STRUCTURAL SLABS	4000	150
ALL OTHER CONCRETE	4000	150

REINFORCING	**GRADE**
TYPICAL BARS	ASTM A615, GRADE 60
WELDED BARS	ASTM A706, GRADE 60

C18
PROVIDE THE FOLLOWING CONCRETE COVERS (UNO):

CONCRETE CAST AGAINST EARTH OR FILL	3 in
CONCRETE EXPOSED TO EARTH AND WEATHER:	
No. 6 THROUGH No. 18 BARS	2 in
No. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1 1/2 in
SLAB ON GROUND	MIDDLE OF SLAB
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
SLABS, WALLS AND JOISTS	
No. 14 AND No. 18 BARS	1 1/2 in
No. 11 BAR AND SMALLER	1 1/2 in
BEAMS, COLUMN:	
PRIMARY REINFORCEMENT, TIES, STIRRUPS, SPIRALS	1 1/2 in
SHELLS, FOLDED PLATE MEMBERS	
No. 6 BAR AND LARGER	1 1/2 in
No. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1 1/2 in

STRUCTURAL STEEL NOTES

S1
REFER TO DIVISION 05 SPECIFICATION SECTION - METAL FABRICATIONS - FOR REQUIREMENTS IN ADDITION TO THOSE LISTED BELOW.

S2
DETAIL, FABRICATE AND ERECT STRUCTURAL STEEL IN CONFORMANCE WITH THE AISC SPECIFICATIONS AND CODES, LATEST EDITIONS.

S3
PERFORM WELDING USING CERTIFIED WELDERS AND IN ACCORDANCE WITH THE AWS "STRUCTURAL WELDING CODE - STEEL", LATEST EDITION. COMPLY WITH AISC SPECIFICATION FOR MINIMUM FILLET WELD SIZES, BUT DO NOT USE LESS THAN A 3/16 INCH FILLET UNLESS SPECIFICALLY NOTED ON THE DRAWINGS.

S4
SUBMIT ENGINEERED AND CHECKED SHOP DRAWINGS TO THE ARCHITECT/ ENGINEER FOR REVIEW. SHOW SHOP FABRICATION DETAILS, FIELD ASSEMBLY DETAILS, AND ERECTION DIAGRAMS FOR STRUCTURAL STEEL. SCHEDULE SUBMISSIONS TO ALLOW ADEQUATE TIME FOR REVIEW PRIOR TO FABRICATION.

S5
AFTER FABRICATION, CLEAN STEEL OF RUST, LOOSE MILL SCALE, DIRT, OIL, GREASE OR OTHER FOREIGN MATERIALS.

S6
DO NOT FIELD CUT STRUCTURAL STEEL UNLESS REVIEWED AND APPROVED BY THE THE COMPANY IN WRITING.

S7
ERECTION PROCEDURES, SEQUENCES AND COORDINATION OF WORK WITH OTHER TRADES IS THE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE ADDITIONAL STEEL REQUIRED FOR ERECTION PURPOSES AT NO COST TO THE OWNER. REMOVE THIS ADDITIONAL STEEL UNLESS DIRECTED OTHERWISE BY THE COMPANY IN WRITING.

S8
PROVIDE TEMPORARY BRACING AND SHORING AS REQUIRED FOR THE SAFETY, STABILITY AND ALIGNMENT OF THE STRUCTURE. LEAVE TEMPORARY BRACING IN PLACE UNTIL THE PERMANENT STRUCTURAL LATERAL LOAD RESISTING SYSTEM IS COMPLETE, INCLUDING FLOOR AND ROOF DIAPHRAGMS. PERFORM FINAL BOLTING AND WELDING ONLY ON THOSE PORTIONS OF THE STRUCTURE THAT HAVE BEEN ALIGNED AND PLUMBED WITHIN THE SPECIFIED TOLERANCES.

S9
PROVIDE NEW MATERIAL CONFORMING TO THE FOLLOWING REQUIREMENTS FOR STRUCTURAL STEEL:

MEMBER	**GRADE**
PLATES	ASTM A36 UNO
EMBEDDED SHEAR STUDS	ASTM A108
HIGH STRENGTH BOLTS, NUTS AND WASHERS	ASTM A-325 OR A-490 (MIN. 3/4" DIAMETER)
STEEL SHAPE WELDING ELECTRODE	E70XX

MISCELLANEOUS

M1
EMPLOY A LICENSED SURVEYOR TO VERIFY EXISTING DIMENSIONS, FLOOR ELEVATIONS, AND FLOOR-TO-FLOOR HEIGHTS BEFORE ORDERING, DETAILING, FABRICATING, OR PLACING NEW CONCRETE AND REINFORCING. THIS INFORMATION MUST BE CONFIRMED AT LOCATIONS WHERE NEW FLOORS AND ROOFS MEET EXISTING CONSTRUCTION.

M2
CONSULT THE ARCHITECTURAL, MECHANICAL, PLUMBING AND ELECTRICAL DRAWINGS FOR LOCATION AND SIZE OF CHASES, INSERTS, OPENINGS, SLEEVES, WASHES, DRIPS, REVEALS, DEPRESSIONS, EQUIPMENT PADS AND OTHER PROJECT REQUIREMENTS. COMBINE THE REQUIREMENTS INTO THE SHOP DRAWINGS AND THE WORK. PROVIDE STRUCTURAL FRAMING PER TYPICAL DETAILS AS REQUIRED AT FLOOR AND ROOF OPENINGS WHERE STRUCTURAL FRAMING IS NOT SHOWN.

M3
THE STRUCTURE IS DESIGNED TO FUNCTION AS A UNIT UPON COMPLETION OF CONSTRUCTION OF THE PROJECT AND THEN, ONLY TO SUPPORT THE DESIGN LOADS INDICATED. THE CONTRACTOR IS RESPONSIBLE FOR MEANS, METHODS AND SEQUENCE OF CONSTRUCTION AND FOR THE ADEQUACY OF THE STRUCTURE TO SUPPORT LOADS OCCURRING DURING CONSTRUCTION. FURNISH TEMPORARY BRACING, SHORING, AND/OR SUPPORT AS REQUIRED.

M4
CHECK DIMENSIONS AGAINST THE REQUIREMENTS OF OTHER CONTRACT DOCUMENTS. RESOLVE APPARENT INCONSISTENCIES IN THE CONTRACT DOCUMENTS WITH THE COMPANY BEFORE PROCEEDING WITH WORK.

M5
SHOW OPENINGS THROUGH STRUCTURAL MEMBERS ON THE SHOP DRAWINGS SUBMITTED FOR REVIEW. OPENINGS WHICH ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS ARE SUBJECT TO REVIEW AND ACCEPTANCE AND ARE TO BE CLEARLY INDICATED FOR REVIEW AND ACCEPTANCE ON THE SHOP DRAWINGS.

M6
DRAWINGS INDICATE GENERAL AND TYPICAL DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY SHOWN, USE DETAILS OF SIMILAR CONSTRUCTION, SUBJECT TO APPROVAL BY THE COMPANY.

M7
WHEREVER THERE IS CONFLICT BETWEEN DETAILS OR TWO DETAILS APPLYING TO THE SAME CONDITION, THE COMPANY WILL HAVE SOLE AUTHORITY TO DETERMINE WHICH DETAIL IS THE MOST APPROPRIATE FOR THE CONDITION.

M9
PROMPTLY NOTIFY THE COMPANY OF ANY STRUCTURAL MEMBERS CALLED OUT ON THE ARCHITECTURAL, MECHANICAL, PLUMBING OR ELECTRICAL DRAWINGS THAT IS NOT IDENTIFIED ON THE STRUCTURAL DRAWINGS. DESIGN OF THESE MEMBERS WILL BE PROVIDED AS NECESSARY UPON NOTIFICATION.

M10
THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE LOCATION AND PLACEMENT OF INSERTS, HANGERS AND OTHER MISCELLANEOUS ITEMS REQUIRED FOR THE SUPPORT OF MECHANICAL, ELECTRICAL AND PLUMBING ITEMS SUSPENDED FROM THE STRUCTURE.

M11
DO NOT MAKE MODIFICATIONS, ALTERATIONS OR REPAIRS TO THE STRUCTURE WITHOUT PRIOR REVIEW BY THE COMPANY. SUBMIT DETAILS AND CALCULATIONS PREPARED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF TENNESEE AND EMPLOYED BY CONTRACTOR.

STRUCTURAL DESIGN LOADS

BUILDING CODE: INTERNATIONAL BUILDING CODE 2012

OCCUPANCY CATEGORY: II

SUPERIMPOSED DEAD LOADS:

BRIDGE CRANE	12.5 TON (CAPACITY)
PROTON BEAM LINE, MAGNETS, ETC.	200 PSF
TEMPORARY SHIELDING	200 PSF
CABLE TRAYS AND CONTENTS (PER TRAY)	50 PLF
MECHANICAL ITEMS SUSPENDED FROM STRUCTURAL FRAMING:	10 PSF
SOIL MASS (16' - 6" THICK)	117 PCF

SUPERIMPOSED LIVE LOADS:

FLOOR LIVE LOADS:	100 PSF

SNOW LOADS: NOT APPLICABLE (UNDERGROUND CONSTRUCTION)

WIND LOADS: NOT APPLICABLE (UNDERGROUND CONSTRUCTION)

EARTHQUAKE DESIGN DATA:

1. SEISMIC IMPORTANCE FACTOR, I = 1.5
2. SPECTRAL RESPONSE ACCELERATIONS
   Ss = 0.375
   S1 = 0.122
3. SITE CLASSIFICATION = D
4. DESIGN SPECTRAL RESPONSE ACCELERATIONS
   SDS = 0.375
   SD1 = 0.188
5. SEISMIC DESIGN CATEGORY = C
6. RESPONSE MODIFICATION COEFFICIENT, R = 1.75

SEISMIC BRACING OF ARCHITECTURAL, MECHANICAL AND ELECTRICAL COMPONENTS

1. FOR SEISMIC DESIGN CATEGORY C COMPONENT BRACING REQUIREMENTS ARE AS FOLLOWS:

ARCHITECTURAL COMPONENTS:	
Ip = 1.0	REQUIRED
Ip = 1.5	REQUIRED
MECHANICAL/ELECTRICAL COMPONENTS:	
Ip = 1.0	EXEMPT
Ip = 1.5	REQUIRED

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Toronto ● Vancouver ● Victoria ● Washington DC

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																									
				REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK									

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
DSN	
DRW	
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD
REV. DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
S0001

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Oak Ridge National Laboratory
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U.S. GOVERNMENT contract DE-AC05-000R22725
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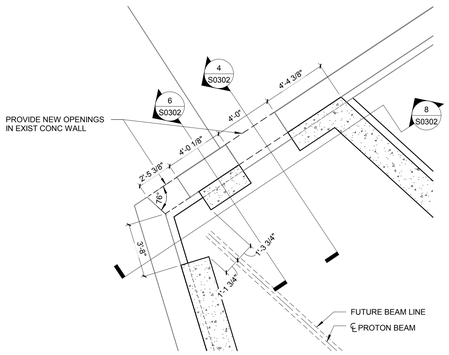
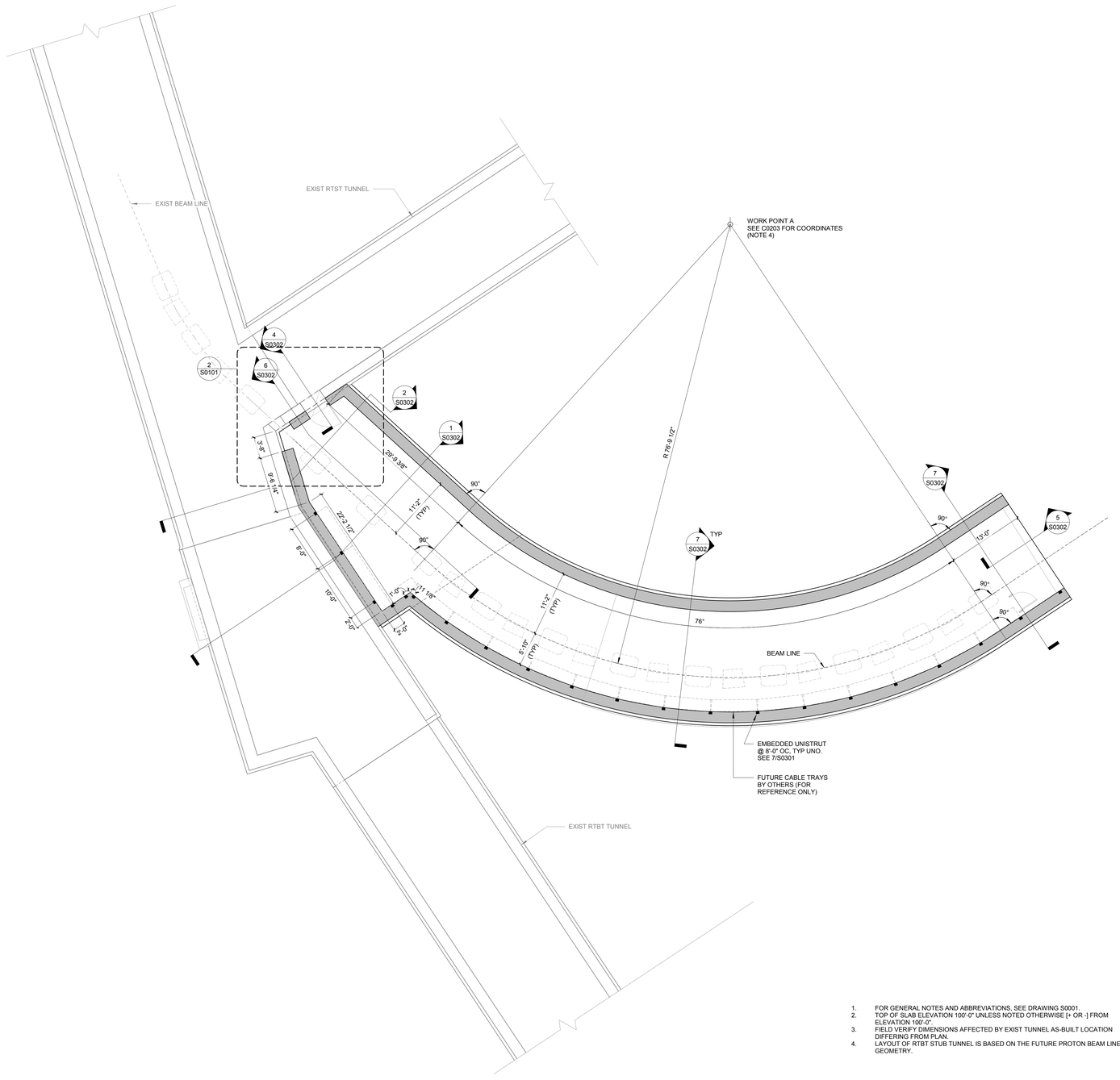
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

GENERAL NOTES AND ABBREVIATIONS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8200	1	1	1	S	U
51		52		53	WBS					REV
NC		NA			1.8.3.2					



2 PART PLAN
1/4" = 1'-0"



1 FOUNDATION PLAN
1/8" = 1'-0"

1. FOR GENERAL NOTES AND ABBREVIATIONS, SEE DRAWING S0001.
2. TOP OF SLAB ELEVATION 100'-0" UNLESS NOTED OTHERWISE [+ OR -] FROM ELEVATION 100'-0".
3. FIELD VERIFY DIMENSIONS AFFECTED BY EXIST TUNNEL AS-BUILT LOCATION DIFFERING FROM PLAN.
4. LAYOUT OF RTBT STUB TUNNEL IS BASED ON THE FUTURE PROTON BEAM LINE GEOMETRY.

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
	DSN
	DRW
	CHK
	DEPT
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD
REV. DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
S0101

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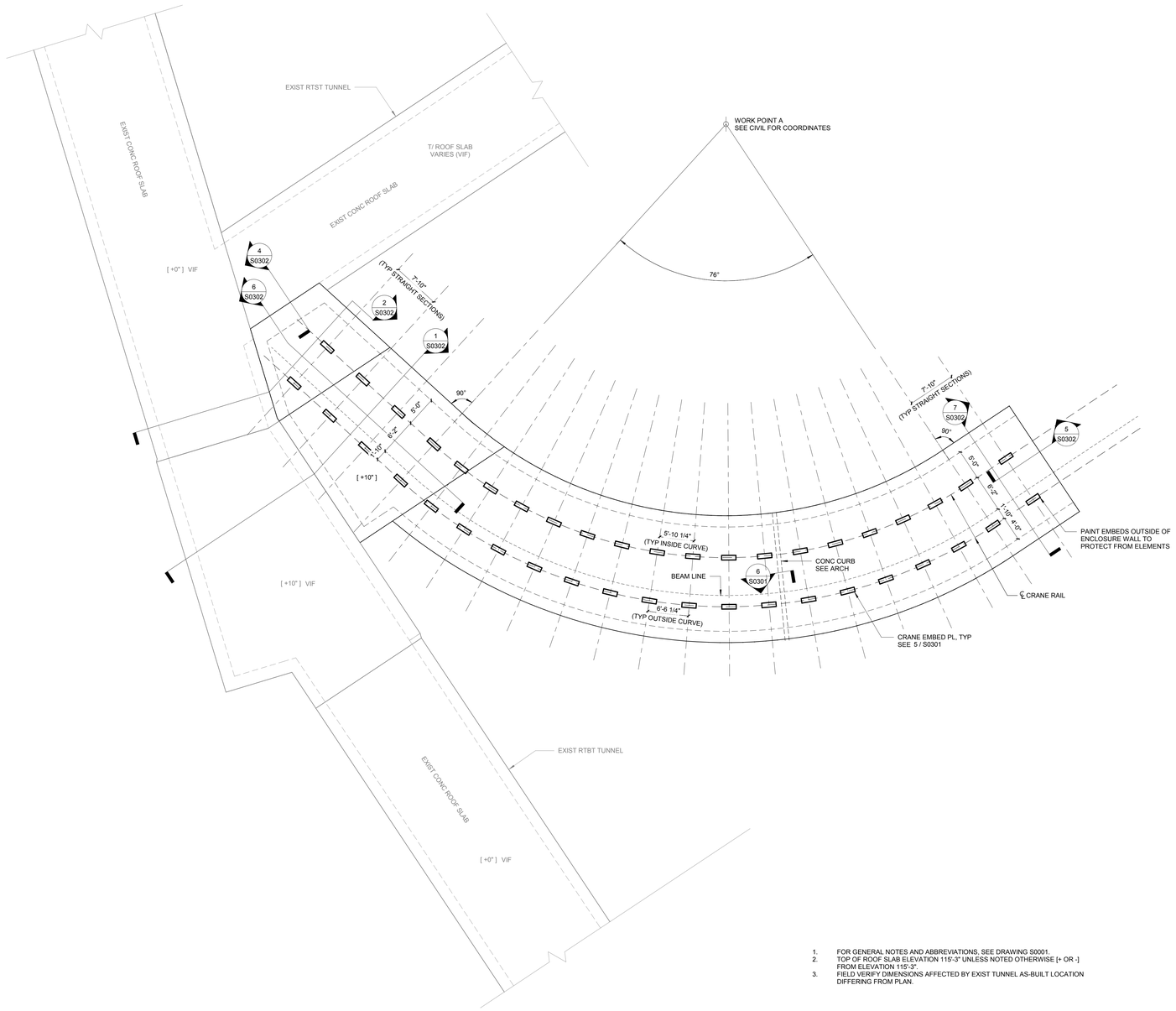
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

LEVEL 01 FOUNDATION PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8200	1	1	1	P	U

51	52	53	WBS	REV
NC	NA		1.8.3.2	



1. FOR GENERAL NOTES AND ABBREVIATIONS, SEE DRAWING S0001.
2. TOP OF ROOF SLAB ELEVATION 115'-3" UNLESS NOTED OTHERWISE [+ OR -] FROM ELEVATION 115'-3".
3. FIELD VERIFY DIMENSIONS AFFECTED BY EXIST TUNNEL AS-BUILT LOCATION DIFFERING FROM PLAN.

1 ROOF PLAN
1/8" = 1'-0"

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Toronto ● Vancouver ● Victoria ● Washington DC

NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY

CHANGE CONTROL SYSTEM
3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
DSN	
DRW	
CHK	
DEPT	
PE	COLLINS
PJ	MARK CONNELL
REQ	TBD
UTB	

REV. DATE DRAWING APPROVALS

A/E DRAWING NUMBER
S0102

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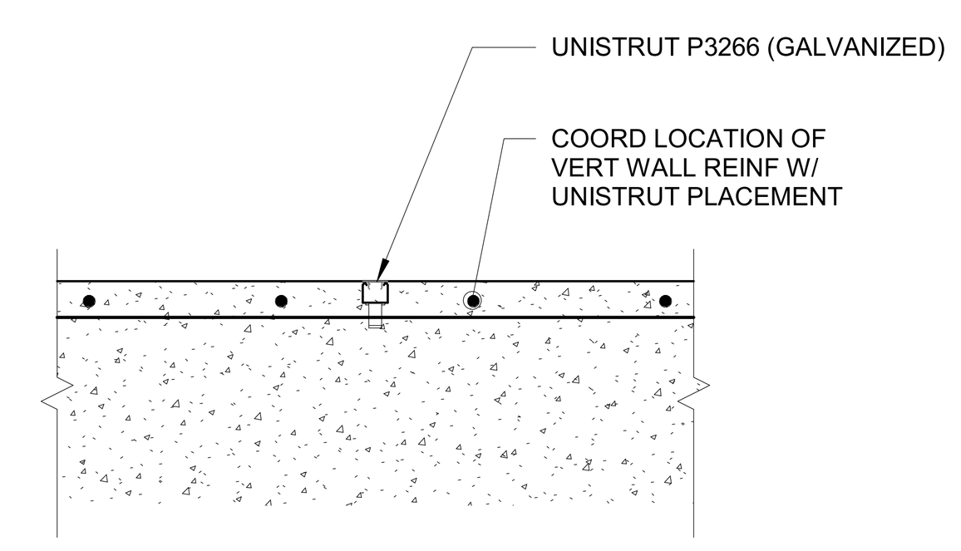
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

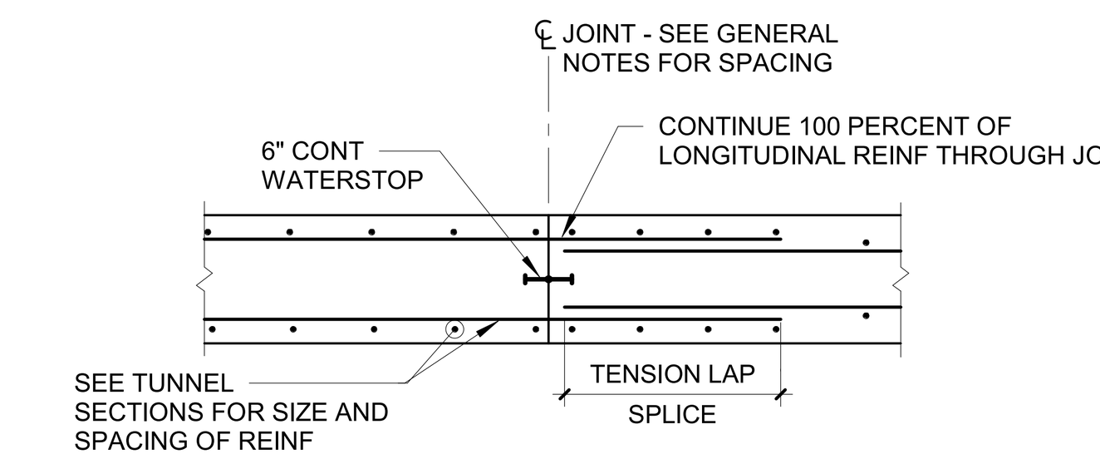
ROOF FRAMING PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8200	1	1	1	P	U

51	52	53	WBS	REV
NC	NA		1.8.3.2	

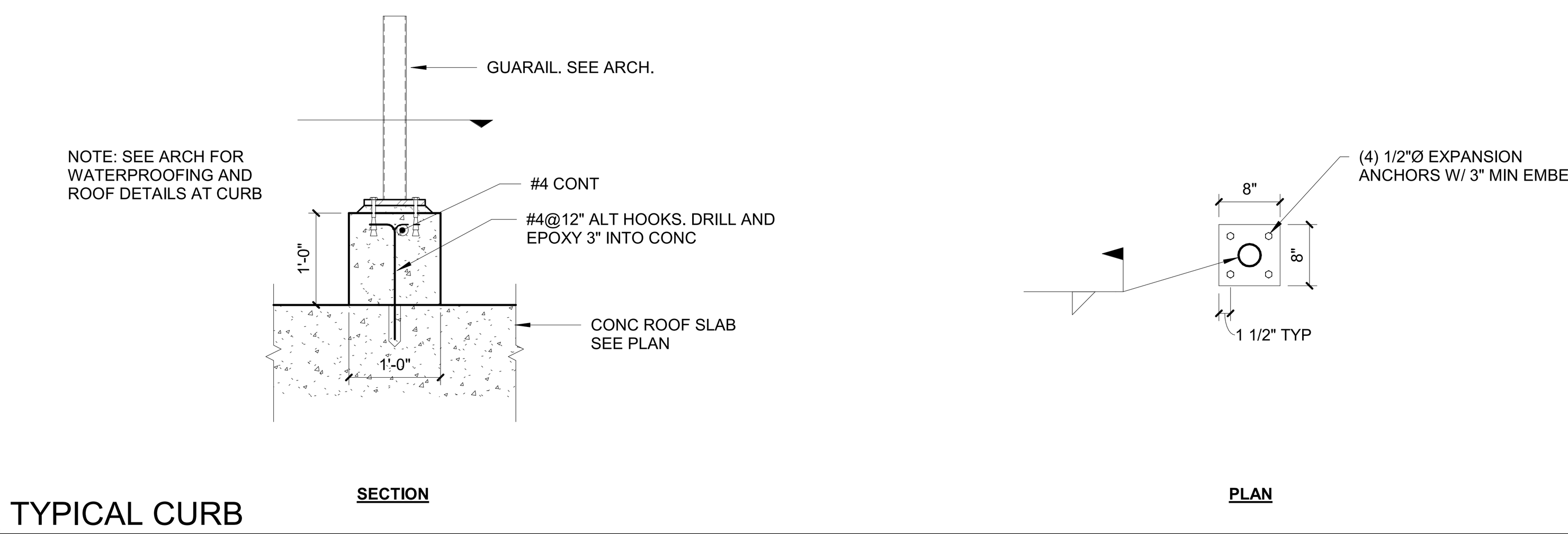


7 TYPICAL EMBEDDED VERTICAL UNISTRUT DETAIL
1" = 1'-0"

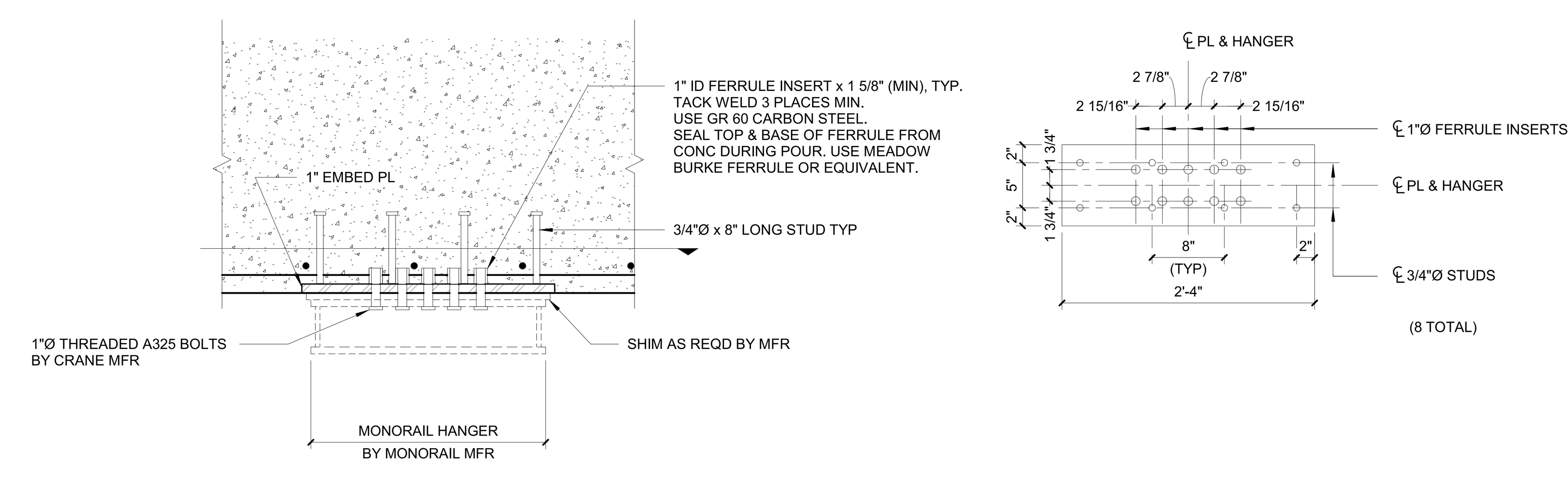


NOTE:
1. ROUGHEN FIRST POUR TO A 1/4" AMPLITUDE OR FORM THE JOINT WITH A STAY-IN-PLACE PERFORATED METAL BULKHEAD TO ACHIEVE THE SAME RESULT.

3 TYPICAL CONSTRUCTION JOINT
NTS

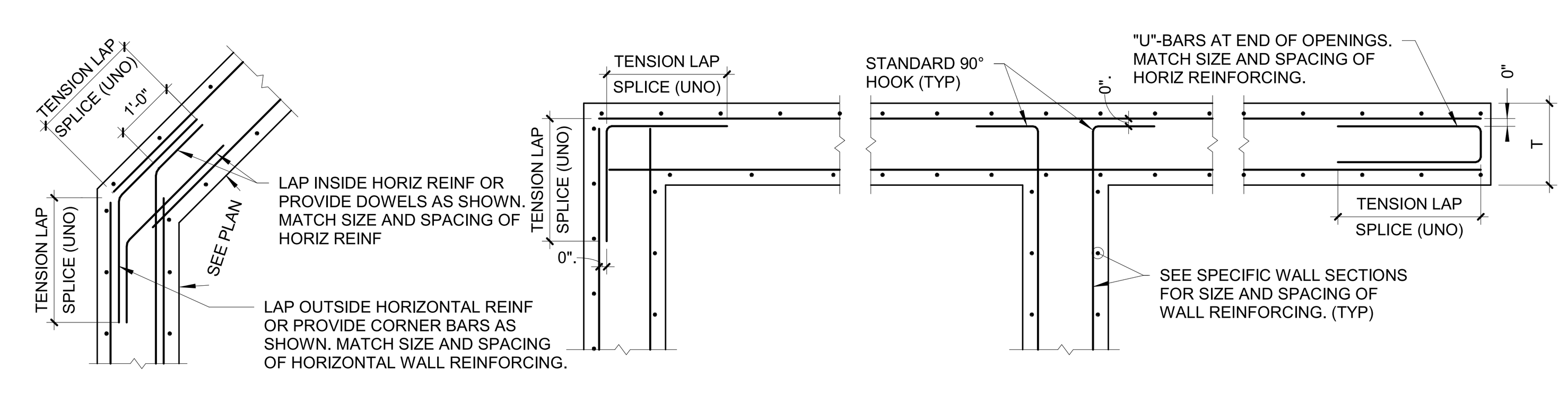


6 TYPICAL CURB
3/4" = 1'-0"



NOTE: MONORAIL NOT SHOWN

5 TYPICAL CRANE EMBED PLATE
1" = 1'-0"



4 TYPICAL WALL REINFORCING DETAILS
NTS

TENSION LAP SPLICE LENGTHS FOR BARS ENCLOSED IN TIES OR STIRRUPS

BAR SIZE	CONCRETE COMPRESSIVE STRENGTH								
	3,000 PSI			4,000 PSI			5,000 PSI		
	BAR TYPE		STD HOOK DEV	BAR TYPE		STD HOOK DEV	BAR TYPE		STD HOOK DEV
	TOP	OTHER		TOP	OTHER		TOP	OTHER	
#3	28	22	6	25	19	6	22	17	6
#4	38	29	8	33	25	7	29	23	6
#5	47	36	10	41	31	8	36	28	7
#6	56	43	12	49	37	10	44	34	9
#7	81	63	13	71	54	12	63	49	10
#8	93	72	15	81	62	13	72	56	12
#9	105	81	17	91	70	15	81	63	13
#10	118	91	19	102	79	17	92	71	15
#11	131	101	22	114	87	19	102	78	17

TENSION LAP SPLICE LENGTHS FOR BARS NOT ENCLOSED IN TIES OR STIRRUPS

BAR SIZE	CONCRETE COMPRESSIVE STRENGTH								
	3,000 PSI			4,000 PSI			5,000 PSI		
	BAR TYPE		STD HOOK DEV	BAR TYPE		STD HOOK DEV	BAR TYPE		STD HOOK DEV
	TOP	OTHER		TOP	OTHER		TOP	OTHER	
#3	17	16	6	16	16	6	16	16	6
#4	28	22	8	25	19	7	22	17	6
#5	41	32	10	36	28	8	32	25	7
#6	56	43	12	49	37	10	44	34	9
#7	90	69	13	78	60	12	70	54	10
#8	112	86	15	97	74	13	87	67	12
#9	135	104	17	117	90	15	105	81	13
#10	162	125	19	141	108	17	126	97	15
#11	190	146	22	165	127	19	147	114	17

NOTES:
1. TABULATED VALUES ARE GIVEN IN INCHES.
2. DIVIDE TABULATED VALUES BY 1.30 TO ACHIEVE STRAIGHT BAR TENSION DEVELOPMENT LENGTHS.
3. APPLY A 1.30 MULTIPLIER ON TABULATED VALUES FOR USE IN LIGHTWEIGHT CONCRETE.
4. APPLY A 1.50 MULTIPLIER ON TABULATED VALUES FOR EPOXY COATED BARS WITH COVER LESS THAN 3 BAR DIAMETERS OR CLEAR SPACING LESS THAN 6 BAR DIAMETERS. APPLY A 1.20 MULTIPLIER ON ALL OTHER EPOXY COATED BARS.
5. MULTIPLIERS FOR LIGHTWEIGHT CONCRETE AND EPOXY COATING ARE ADDITIVE.
6. TOP BARS ARE DEFINED AS HORIZONTAL REINFORCEMENT WITH MORE THAN 12 INCHES OF CONCRETE CAST BELOW THE DEVELOPMENT LENGTH OR SPLICE.
7. "SIDE LAP" LAP SPLICES TO MAINTAIN SPECIFIED CONCRETE COVER. WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED, USE THE LARGER OF THE DEVELOPMENT LENGTH OF THE LARGER BAR OR THE LAP SPLICE LENGTH OF THE SMALLER BAR.
8. NON-CONTACT SPLICES NOT PERMITTED.

2 TENSION LAP SPLICE LENGTHS FOR GRADE 60 REINFORCEMENT
NTS

COMPRESSION DEVELOPMENT AND LAP SPLICE LENGTHS

BAR SIZE	CONCRETE COMPRESSIVE STRENGTH					
	3,000 PSI		4,000 PSI		5,000 PSI	
	DEV	SPLICE	DEV	SPLICE	DEV	SPLICE
#3	9	12	8	12	8	12
#4	11	15	10	15	9	15
#5	14	19	12	19	12	19
#6	17	23	15	23	14	23
#7	20	27	17	27	16	27
#8	22	30	19	30	18	30
#9	25	34	22	34	21	34
#10	28	39	25	39	23	39
#11	31	43	27	43	26	43

NOTES:
1. TABULATED VALUES ARE GIVEN IN INCHES.
2. COMPRESSION SPLICES PERMISSIBLE ONLY WHERE SPECIFICALLY NOTED.
3. TABLE IS APPLICABLE FOR NORMAL WEIGHT CONCRETE.
4. TABLE NOT APPLICABLE FOR EPOXY COATED REINFORCEMENT
5. "SIDE LAP" LAP SPLICES TO MAINTAIN SPECIFIED CONCRETE COVER.
6. WHEN BARS OF DIFFERENT SIZE ARE LAP SPLICED, THE SPLICE LENGTH SHALL BE THE LARGER OF THE DEVELOPMENT LENGTH OF THE LARGER BAR, OR THE SPLICE LENGTH OF THE SMALLER BAR.

1 COMPRESSION LAP SPLICE LENGTHS FOR GRADE 60 REINFORCEMENT
NTS

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SECTION AND DETAIL KEY
NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

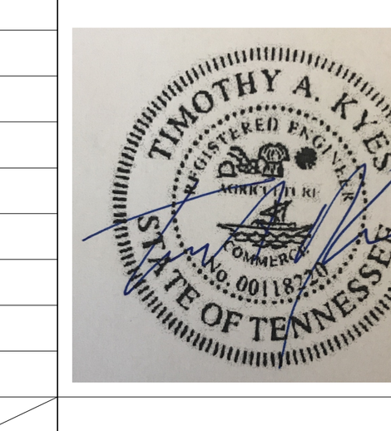
THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	--	4	--																										

REVISION OR ISSUE PURPOSE — REVISION OR ISSUE REVIEWERS — INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE



DSN
DRW
CHK
DEPT
PE COLLINS
PJ MARK CONNELL
REQ TBD
UTB
REV. DATE
DRAWING APPROVALS

A/E DRAWING NUMBER
S0301

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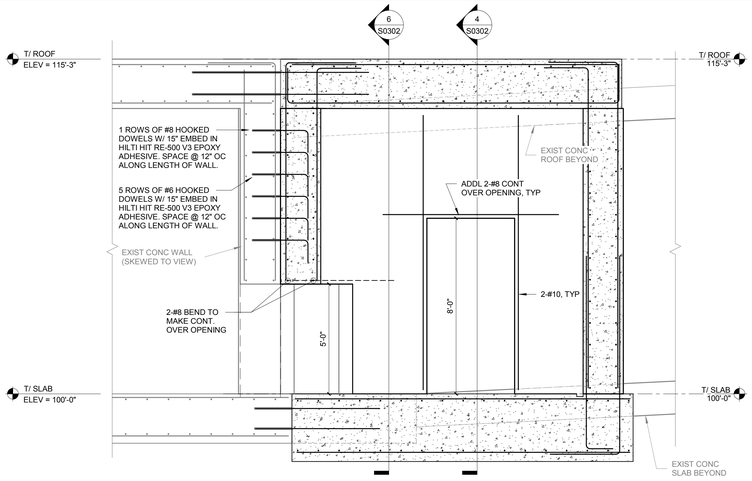
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

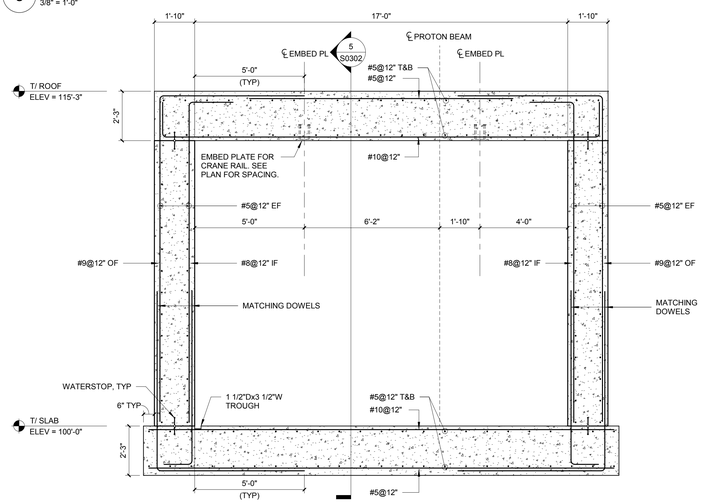
TYPICAL CONCRETE DETAILS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8200	1	1	1	D	U
51	52	53	WBS							REV
NC	NA		1.8.3.2							



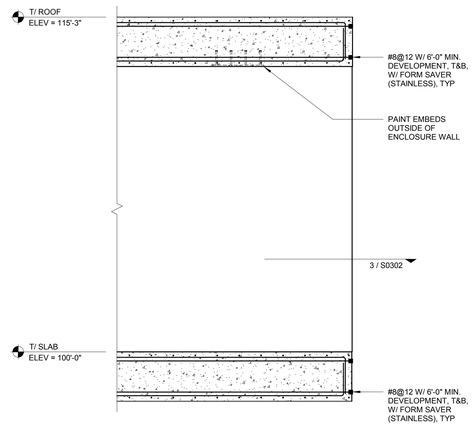
NOTE: 1. FOR TYPICAL CONC ROOF, SLAB, AND WALL REINF SEE 2 / S0302
2. COORD CONDUIT LOCATIONS W/ ELEC
3. REMOVE 100% OF EXISTING WATERPROOFING AND CLEAN EXISTING CONCRETE SURFACE WITHIN 1'-6" OF ALL POST INSTALLED REINFORCING DOWEL LOCATIONS.

8 ELEVATION AT WEST END
3/8" = 1'-0"



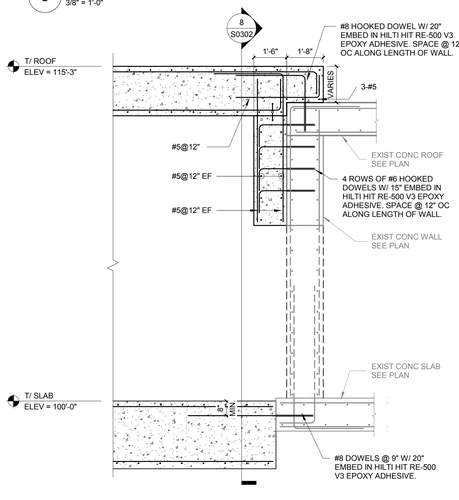
NOTE: PROVIDE VERTICAL P3266 (12 FT LONG) GALVANIZED UNISTRUT EMBEDDED IN CONCRETE WALL. LOCATE END OF EMBED 6" FROM UNDERSIDE OF ROOF SLAB. SEE PLAN FOR SPACING.

7 SECTION
3/8" = 1'-0"



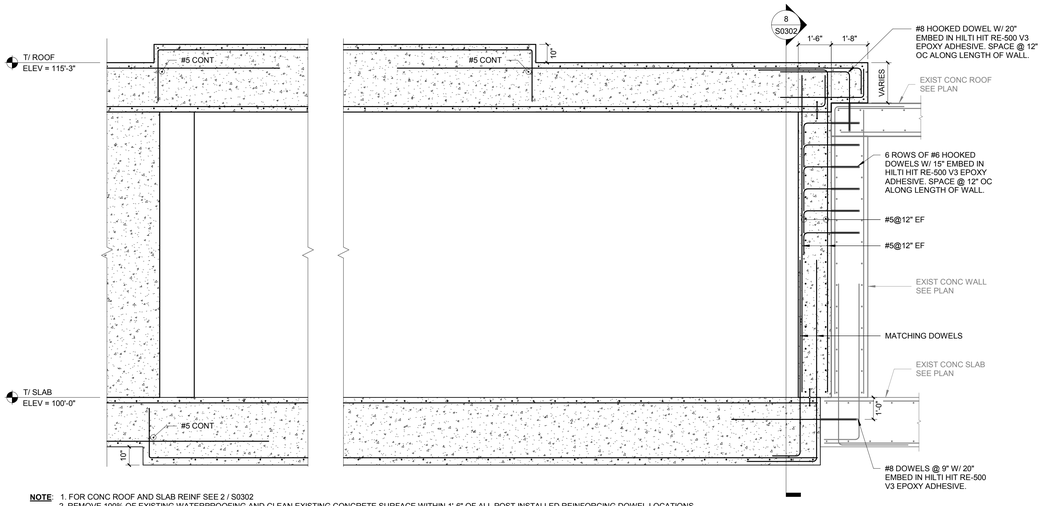
NOTE: FOR CONC ROOF AND SLAB REINF SEE 7 / S0302

5 SECTION
3/8" = 1'-0"



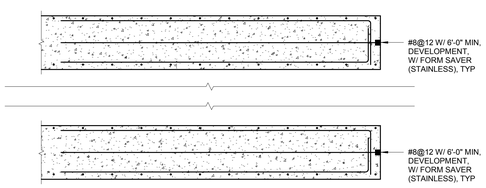
NOTE: 1. FOR CONC ROOF AND SLAB REINF SEE 2 / S0302
2. FOR ADDL REINF OVER OPENING SEE 8 / S0302
3. REMOVE 100% OF EXISTING WATERPROOFING AND CLEAN EXISTING CONCRETE SURFACE WITHIN 1'-6" OF ALL POST INSTALLED REINFORCING DOWEL LOCATIONS.

4 SECTION
3/8" = 1'-0"



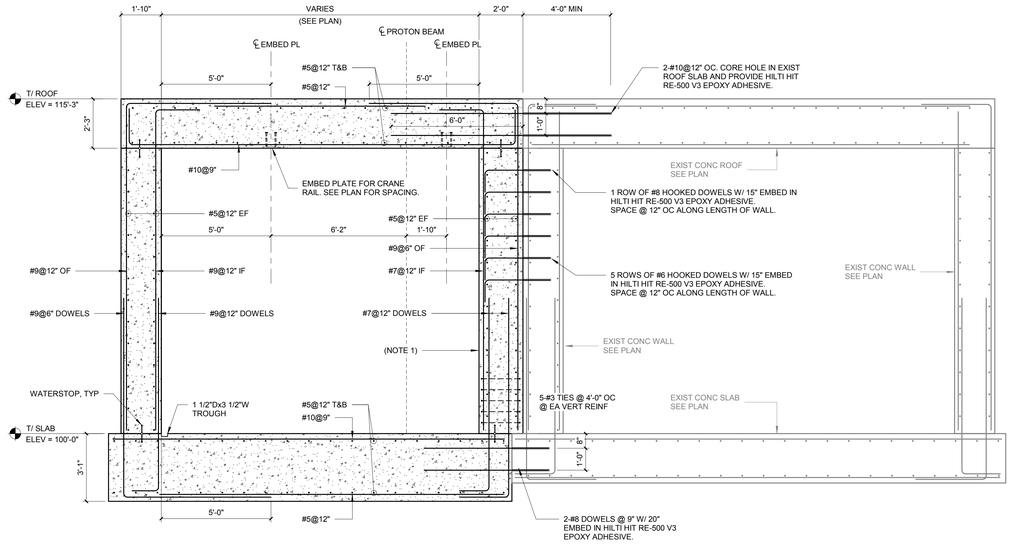
NOTE: 1. FOR CONC ROOF AND SLAB REINF SEE 2 / S0302
2. REMOVE 100% OF EXISTING WATERPROOFING AND CLEAN EXISTING CONCRETE SURFACE WITHIN 1'-6" OF ALL POST INSTALLED REINFORCING DOWEL LOCATIONS.

6 SECTION
3/8" = 1'-0"



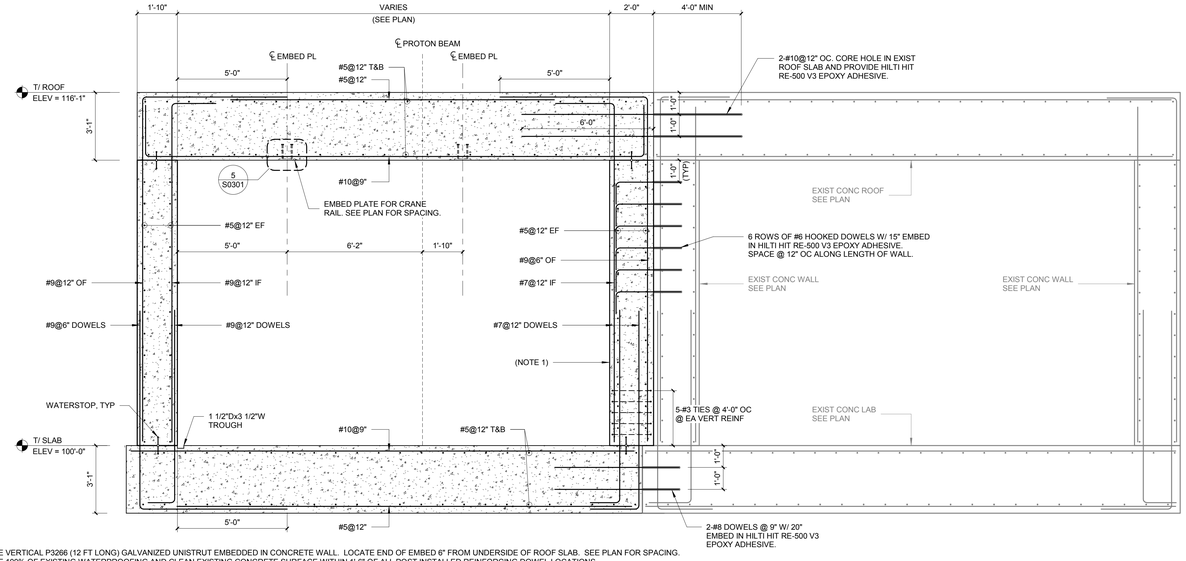
NOTE: FOR CONC WALL REINF SEE 7 / S0302

3 END WALL DETAIL
1/2" = 1'-0"



NOTE: 1. PROVIDE VERTICAL P3266 (12 FT LONG) GALVANIZED UNISTRUT EMBEDDED IN CONCRETE WALL. LOCATE END OF EMBED 6" FROM UNDERSIDE OF ROOF SLAB. SEE PLAN FOR SPACING.
2. REMOVE 100% OF EXISTING WATERPROOFING AND CLEAN EXISTING CONCRETE SURFACE WITHIN 1'-6" OF ALL POST INSTALLED REINFORCING DOWEL LOCATIONS.

2 SECTION
3/8" = 1'-0"



NOTE: 1. PROVIDE VERTICAL P3266 (12 FT LONG) GALVANIZED UNISTRUT EMBEDDED IN CONCRETE WALL. LOCATE END OF EMBED 6" FROM UNDERSIDE OF ROOF SLAB. SEE PLAN FOR SPACING.
2. REMOVE 100% OF EXISTING WATERPROOFING AND CLEAN EXISTING CONCRETE SURFACE WITHIN 1'-6" OF ALL POST INSTALLED REINFORCING DOWEL LOCATIONS.

1 SECTION
3/8" = 1'-0"

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Toronto ● Vancouver ● Victoria ● Washington DC

NUMBER OF SECTION OR DETAIL
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SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	DSN
	DRW
	CHK
	DEPT
	PE COLLINS
	PJ MARK CONNELL
	REQ TBD
REV. DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
S0302

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Oak Ridge National Laboratory
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U.S. GOVERNMENT contract DE-AC05-00OR22725
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PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

CONCRETE DETAILS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	S	X	X	8	8200	1	1	1	D	U
51		52		53	WBS					REV
NC		NA			1.8.3.2					

PLAN SYMBOLS

- EXISTING CONSTRUCTION TO REMAIN
- EXISTING CONSTRUCTION TO BE REMOVED
- NEW CONSTRUCTION
- INDICATES AREAS NOT IN CONTRACT

REFERENCE SYMBOLS (ARCHITECTURAL)

- ROOM NAME AND NUMBER: OFFICE / 1125 — ROOM NAME; ROOM NUMBER
- PARTITION: A1 — PARTITION TYPE
- INTERIOR DOOR ASSEMBLY: 1125A — ROOM NUMBER SERVED BY DOOR; SUFFIX ADDED IF MULTIPLE DOORS SERVE SAME ROOM
- EXTERIOR DOOR ASSEMBLY: E101 — DENOTES EXTERIOR DOOR; NUMBERED SEQUENTIALLY
- LOUVER: L10
- SHEET NOTE: C1 — DEMOLITION; 1 — CONSTRUCTION; 4 — INTERIOR ELEVATION KEY TO MATERIAL
- KEYNOTE: 042000 - UNIT MASONRY — SPECIFICATION SECTION; SPECIFIED ITEM
- EQUIPMENT: DESCRIPTION — EQUIPMENT DESCRIPTION; EQ-1 — EQUIPMENT IDENTIFIER
- ROOF ASSEMBLY TAG: RA-1
- EXTERIOR WALL ASSEMBLY TAG: WA-1
- FINISH TAG: F / W / B
- WALL FINISH TAG: P-3

REFERENCE SYMBOLS (ALL DISCIPLINES)

- WALL SECTION: 1 / A0401 / SIM — DETAIL/ SECTION NUMBER; SIMILAR INDICATION; SHEET NUMBER
- BUILDING SECTION: 1 / A0401 / SIM — DETAIL / SECTION NUMBER; SHEET NUMBER
- DETAIL SECTION: 1/A101 SIM — DETAIL NUMBER; SHEET NUMBER
- EXTERIOR ELEVATION: 22 SIM / A0401 — ELEVATION NUMBER; REFERENCE TYPE, AS NEEDED: TYP OR SIM; SHEET NUMBER
- INTERIOR ELEVATION: SIM / 1 2 3 4 / A0601 — SIMILAR INDICATION (WHERE APPLICABLE); ELEVATION NUMBER; SHEET NUMBER
- LARGE SCALE BLOWUP OF PLAN OR DETAIL: 1 / A0402 / SIM — PLAN OR DETAIL NUMBER; SHEET NUMBER
- LEVEL REFERENCE: LEVEL 02 / 118'-6" — LEVEL DESCRIPTION; LEVEL ELEVATION
- NEW STRUCTURAL GRID: R — GRID REFERENCE; GRID LINE
- EXISTING STRUCTURAL GRID: 2 — EXISTING GRID REFERENCE; EXISTING GRID LINE
- MATCH LINE: 1 / A101; 1 / A101 — SHEET NUMBER; SHEET NUMBER; MATCH LINE
- REVISION: 1 — REVISION NUMBER (SHEET SPECIFIC); CLOUDED AREA OF REVISION
- NORTH ARROW: N
- SPOT ELEVATION
- CENTERLINE: ℄

MATERIALS

- CONCRETE MASONRY UNIT
- CONCRETE OR PRECAST
- EARTH
- GRAVEL OR POROUS FILL
- WOOD FRAMING
- WOOD BLOCKING OR SHIM
- PLASTER AND GYPSUM BOARD

ABBREVIATIONS

ADJ	ADJACENT
AFF	ABOVE FINISHED FLOOR
ALT	ALTERNATE
APPROX	APPROXIMATE
ARCH	ARCHITECT(URAL)
BLDG	BUILDING
BLKG	BLOCKING
BRG	BEARING
C	COURSE
CFCI	CONTRACTOR FURNISHED - CONTRACTOR INSTALLED
CFMF	COLD-FORMED METAL FRAMING
CIP	CAST-IN-PLACE
CJ	CONTROL JOINT
CL	CENTERLINE
CLR	CLEAR(ANCE)
CMU	CONCRETE MASONRY UNIT
CO	CLEAN OUT
COL	COLUMN
CONC	CONCRETE
CONT	CONTINUOUS
CONTR	CONTRACT(OR)
DEMO	DEMOLISH / DEMOLITION
DEPT	DEPARTMENT
DIA	DIAMETER
DIAG	DIAGONAL
DIM	DIMENSION
DN	DOWN
EA	EACH
EJ	EXPANSION JOINT
ELEC	ELECTRIC(AL)
EL	ELEVATION
ELEV	ELEVATOR
EMER	EMERGENCY
EOS	EDGE OF SLAB
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE(D)
EXH	EXHAUST
EXIST	EXISTING
EXP	EXPANSION
EXPD	EXPOSED
EXT	EXTERIOR
FD	FLOOR DRAIN
FDTN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FIN	FINISH(ED)
FLR	FLOOR
GA	GAUGE / GAGE
GFRC	GLASS FIBER REINF CONCRETE
GFRG	GLASS FIBER REINF GYPSUM
GWB	GYPSUM WALL BOARD
GYP	GYPSUM
HDW	HARDWARE
HM	HOLLOW METAL
HP	HIGH POINT
ID	INSIDE DIAMETER
INST	INSTALL(ED)
INSUL	INSULATION / INSULATED
JT	JOINT
LP	LOW POINT
MATL	MATERIAL
MAX	MAXIMUM
MCM	METAL COMPOSITE MATERIAL
MECH	MECHANICAL
MFR	MANUFACTURER / MANUFACTURED
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NSMF	NON-STRUCTURAL METAL FRAMING
NTS	NOT TO SCALE
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED - CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED - OWNER INSTALLED
OH	OVERHEAD
OPNG	OPENING
OPP	OPPOSITE
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCONC	POLISHED CONCRETE
PL	PLATE
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PLSHD	POLISHED
PNT	PAINT(ED)
QTY	QUANTITY
RAD	RADIUS
RD	ROOF DRAIN
REF	REFER TO / REFERENCE TO
REINF	REINFORCED / REINFORCING
REQD	REQUIRED
RFG	ROOFING
RH	RIGHT HAND
RO	ROUGH OPENING
ROW	RIGHT OF WAY
S	SEALED
SECT	SECTION
SHT	SHEET
SIM	SIMILAR
SOG	SLAB-ON-GRADE
SPEC	SPECIFY / SPECIFICATION
STD	STANDARD
STL	STEEL
STRUCT	STRUCTURE / STRUCTURAL
SUSP	SUSPENDED
TBD	TO BE DETERMINED
TEMP	TEMPORARY
TEXT	TEXTURE
THK	THICK(NESS)
TOS	TOP OF STEEL
TOW	TOP OF WALL
TP	TANGENT POINT
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VIF	VERIFY IN FIELD
VTR	VENT THROUGH ROOF
WP	WORK POINT

ORNL GRID NORTH / TRUE NORTH

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0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE: CURT DOUGLAS FINFROCK, REGISTERED ARCHITECT, AGRICULTURE, COMMERCE, No. 105944, STATE OF TENNESSEE

DSN	Designer
DRW	Author
CHK	Checker
DEPT	
PE	M. BUCHANAN
PJ	MARK CONNELL
REQ	TBD
UTB	

REV. DATE
DRAWING APPROVALS

A/E DRAWING NUMBER
A0101

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PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

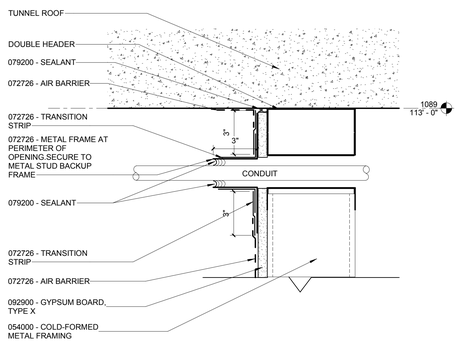
SYMBOLS & ABBREVIATIONS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U

51	52	53	WBS	REV
NC	NA		1.8.3.2	

GENERAL NOTES:

1. LAYOUT OF RTBT TUNNEL IS BASED ON THE FUTURE PROTON BEAM LINE GEOMERTY, TO BE PROVIDED BY THE COMPANY.



4 / A0701 AIR BARRIER PENETRATION SECTION DETAIL
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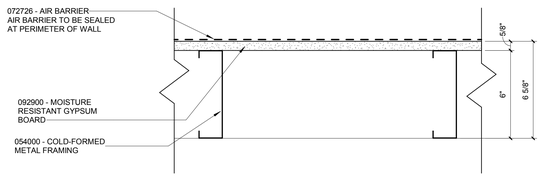
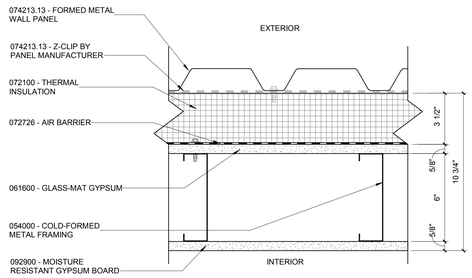
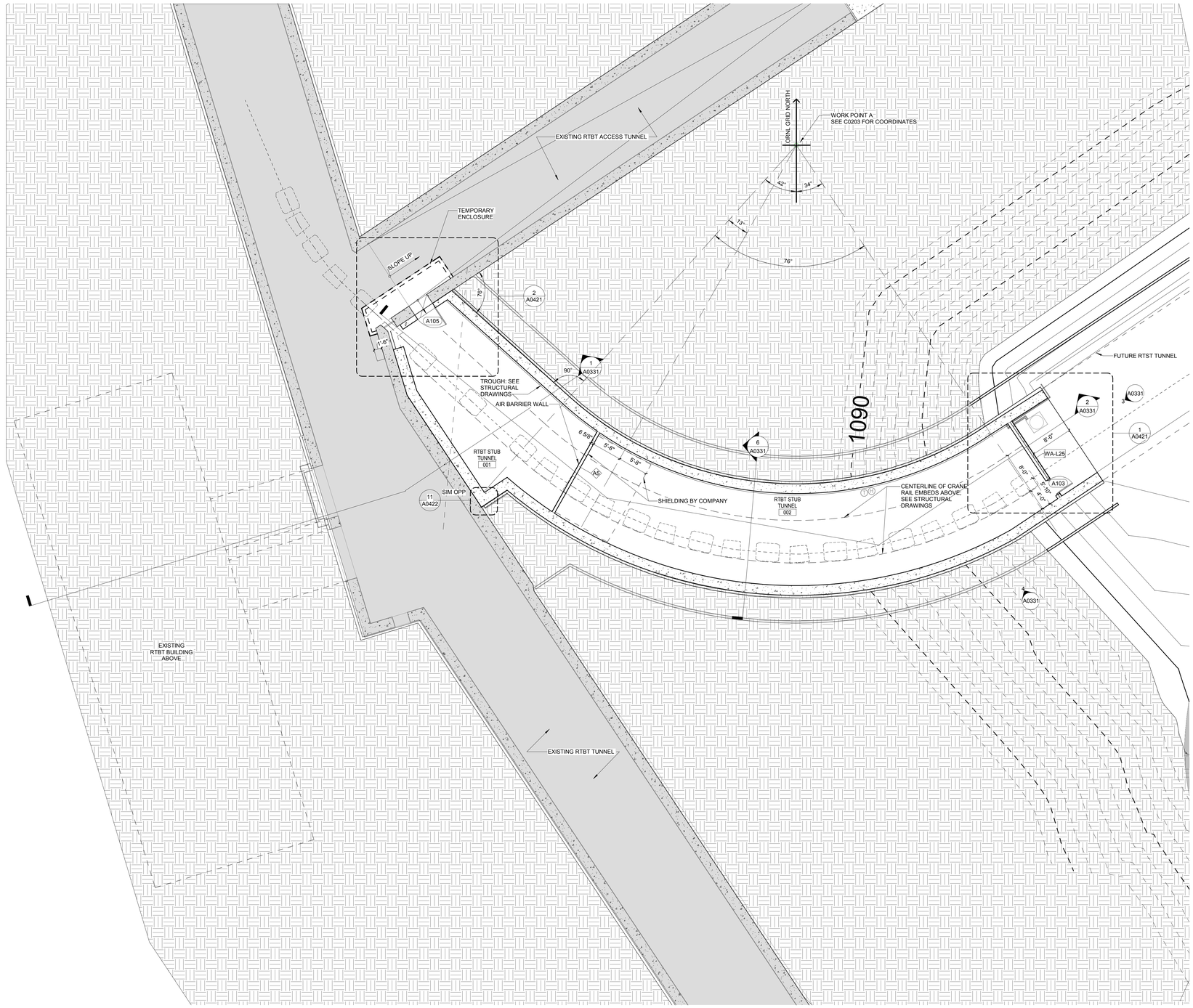


3 A5 TEMPORARY WALL ENCLOSURE PLAN DETAIL
3" = 1'-0"



2 WA-L25 END WALL PLAN DETAIL
3" = 1'-0"



1 RTBT STUB FLOOR PLAN
1/8" = 1'-0"

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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
DSN	M. MICHILINI
DRW	A. BELTRAN
CHK	J. HOWARD
DEPT	
PE	M. BUCHANAN
PJ	MARK CONNELL
REQ	TBD
REV.	
DATE	
UTB	

CURTIS DOUGLAS FINLEY — REGISTERED ARCHITECT — No. 10591 — STATE OF TENNESSEE

DRAWING APPROVALS

A/E DRAWING NUMBER
A0102

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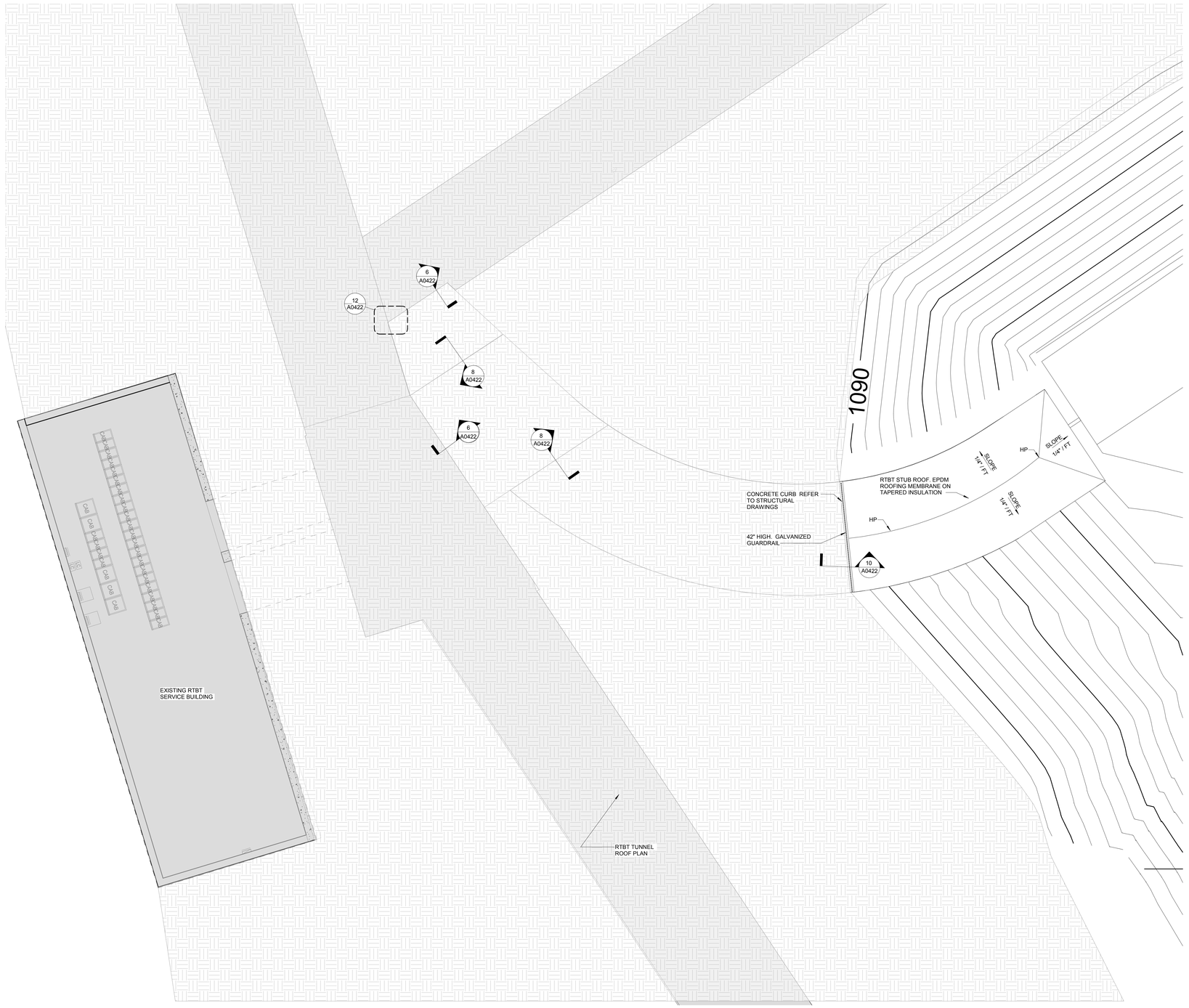
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

PPU RTBT STUB FLOOR PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U

51	52	53	WBS	REV
NC	NA		1.8.3.2	



1 A0331 RTBT STUB ROOF PLAN

1/8" = 1'-0"

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NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE

CURD DOUGLAS FINFROCK
REGISTERED ARCHITECT
No. 105944
STATE OF TENNESSEE

DSN	M. MICHILINI
DRW	A. BELTRAN
CHK	J. HOWARD
DEPT	
PE	M. BUCHANAN
PJ	MARK CONNELL
REQ	TBD
UTB	

REV. DATE — DRAWING APPROVALS

A/E DRAWING NUMBER
A0103

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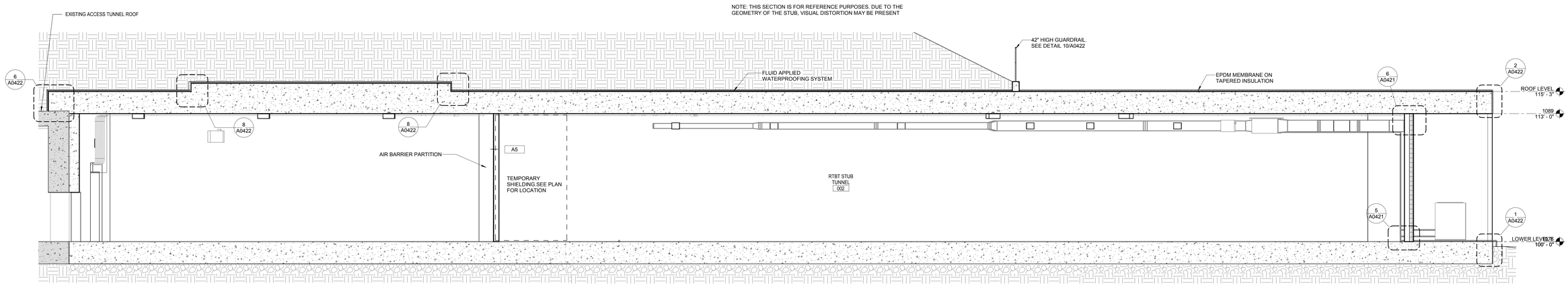
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

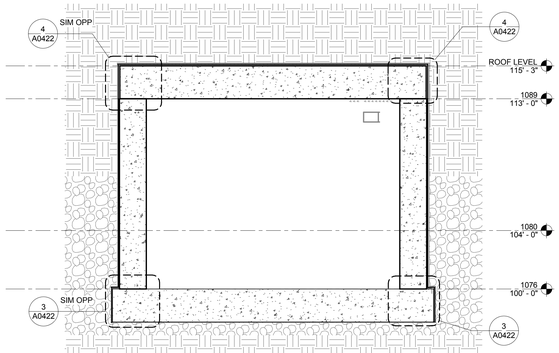
PPU RTBT STUB ROOF PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U

51	52	53		REV
NC	NA		WBS 1.8.3.2	



2 A0102 RTBT ACCESS TUNNEL/ PPU RTBT STUB SECTION
1/4" = 1'-0"



6 A0102 TYPICAL TUNNEL SECTION
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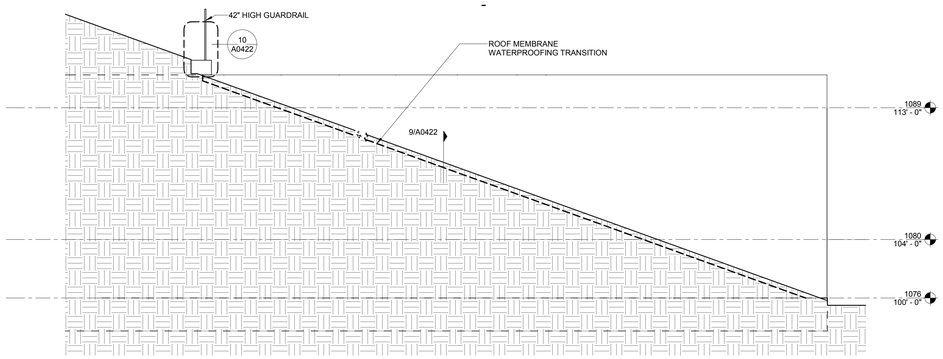
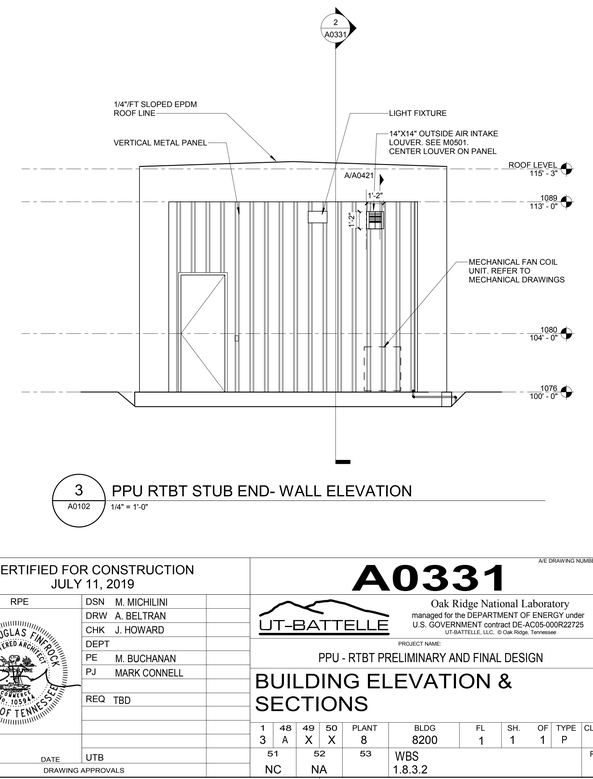


4 A0102 PPU RTBT STUB TYPICAL END-WALL EXTERIOR ELEVATION
1/4" = 1'-0"

1 A0102 RTBT SERVICE BUILDING/RTBT TUNNEL/PPU RTBT STUB SECTION
1/4" = 1'-0"



3 A0102 PPU RTBT STUB END- WALL ELEVATION
1/4" = 1'-0"

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SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---	REVISION OR ISSUE PURPOSE	REVISION OR ISSUE REVIEWERS															INTER-DISCIPLINE CHECK									

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	DSN	M. MICHILINI
	DRW	A. BELTRAN
	CHK	J. HOWARD
	DEPT	
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	REQ	TBD
REV.	DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
A0331

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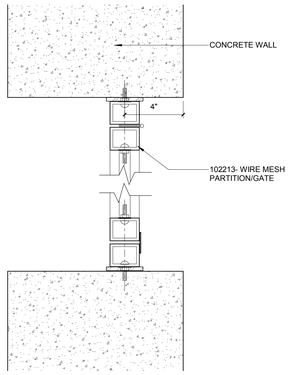
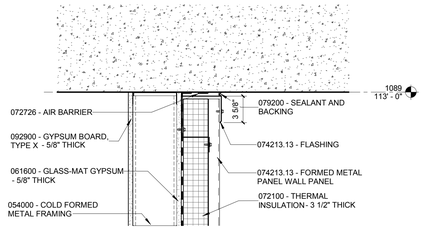
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

BUILDING ELEVATION & SECTIONS

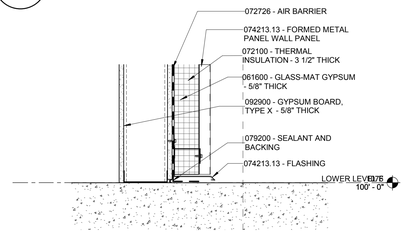
1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U
51		52		53	WBS					REV
NC		NA			1.8.3.2					



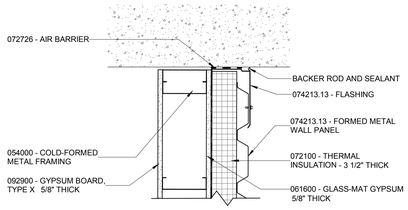
7 WIRE MESH JAMB DETAIL
3" = 1'-0"



6 (A0331) WALL HEAD DETAIL
1 1/2" = 1'-0"



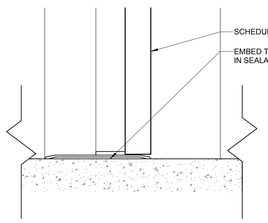
5 (A0331) WALL BASE DETAIL
1 1/2" = 1'-0"



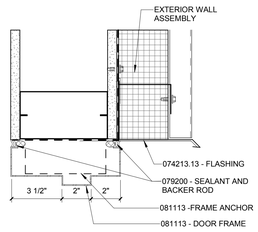
4 (A0421) END WALL PLAN DETAIL
1 1/2" = 1'-0"

DOOR SCHEDULE

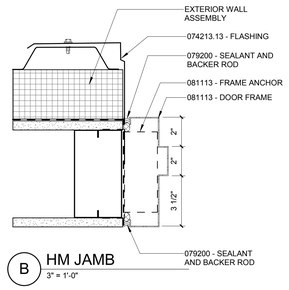
OPENING NUMBER	DOOR						FRAME		SCHEDULE FIRE RATING	STC	HARDWARE GROUP	COMMENTS
	OPENING WIDTH	OPENING HEIGHT	PANEL A TYPE	THICKNESS	MATERIAL	GLAZING TYPE	MATERIAL & TYPE	GLAZING TYPE				
A103	3' - 0"	8' - 0"	F	1 3/4"	HM	-	HM-00	-	-		01	
A105	4' - 0"	7' - 0"	F : G	1 3/4"	HM	-	- -	-	-		02	WIRE GATE



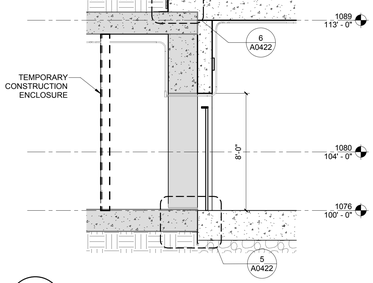
D SILL
3" = 1'-0"



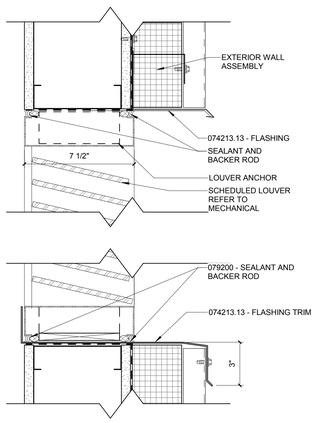
C HM HEAD
3" = 1'-0"



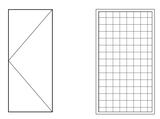
B HM JAMB
3" = 1'-0"



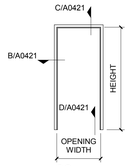
3 (A0331) PEDESTRIAN OPENING SECTION
1/4" = 1'-0"



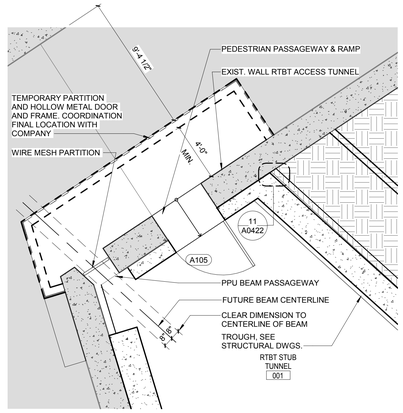
A (A0331) WALL LOUVER DETAIL
3" = 1'-0"



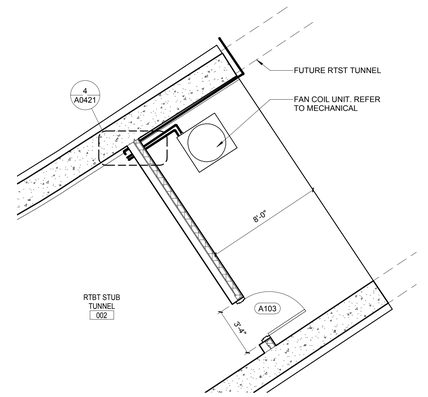
PANEL TYPES



FRAME TYPES



2 (A0102) PPU RTBT STUB PLAN DETAIL (NORTH)
1/4" = 1'-0"



1 (A0102) PPU RTBT STUB PLAN DETAIL (SOUTH)
1/4" = 1'-0"

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										
REV.				REVISION OR ISSUE PURPOSE				DATE	REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK										

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE
CURD DOUGLAS FINFROCK
REGISTERED ARCHITECT
No. 105914
STATE OF TENNESSEE

DSN	M. MICHILINI
DRW	A. BELTRAN
CHK	J. HOWARD
DEPT	
PE	M. BUCHANAN
PJ	MARK CONNELL
REQ	TBD
UTB	

DRAWING APPROVALS

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A/E DRAWING NUMBER
A0421

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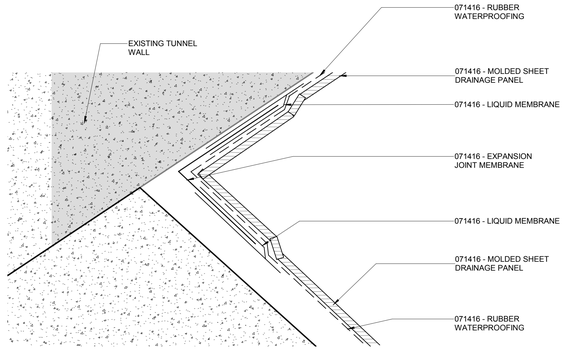
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

ENLARGED PLANS & DETAILS

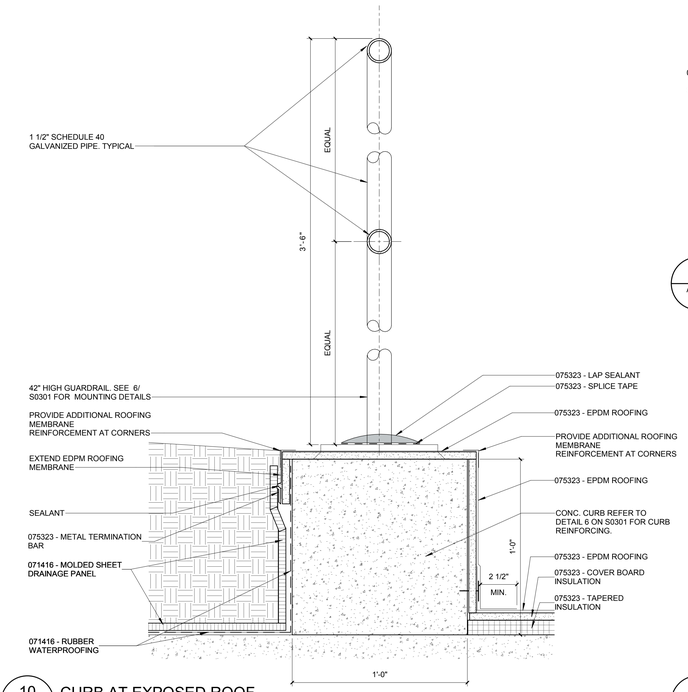
A0331

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U

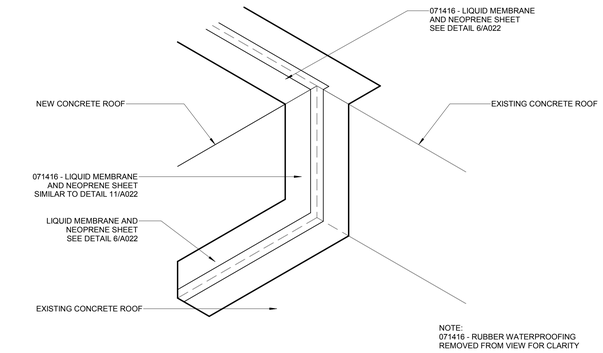
51	52	53		REV
NC	NA		WBS 1.8.3.2	



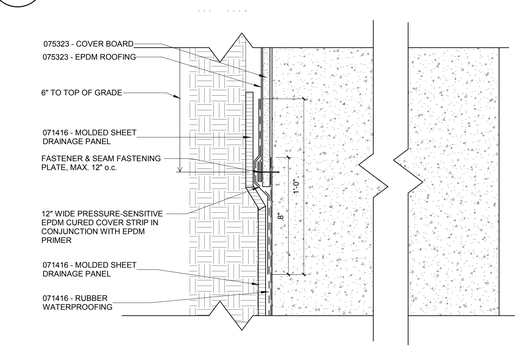
11 A0102 — PPU RTBT STUB PLAN DETAIL
3" = 1'-0"



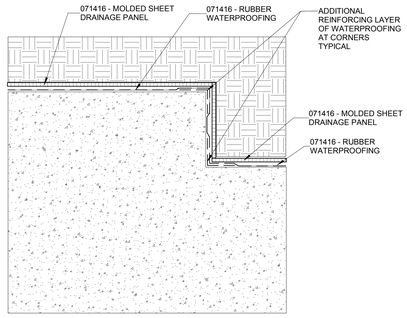
10 A0331 — CURB AT EXPOSED ROOF
3" = 1'-0"



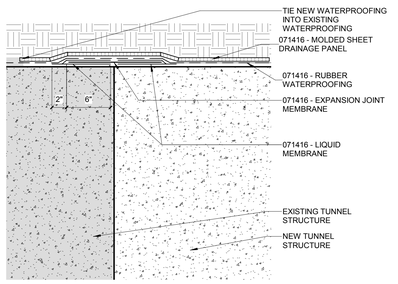
12 A0103 — WATERPROOFING EXPANSION CORNER DIAGRAM
3" = 1'-0"



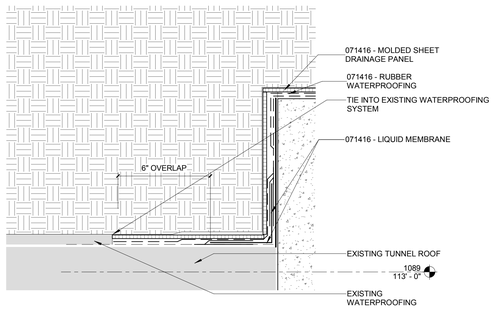
9 A0331 — WATERPROOFING TO ROOFING TRANSITION AT SIDE WALL
3" = 1'-0"



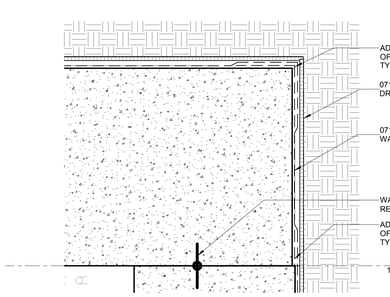
8 A0331 — WATERPROOFING CORNER REINFORCEING
1 1/2" = 1'-0"



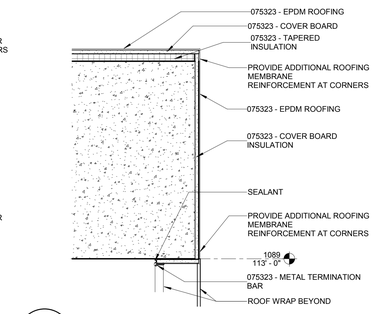
7 A0331 — RTBT TUNNEL/ RTBT STUB HEAD
1 1/2" = 1'-0"



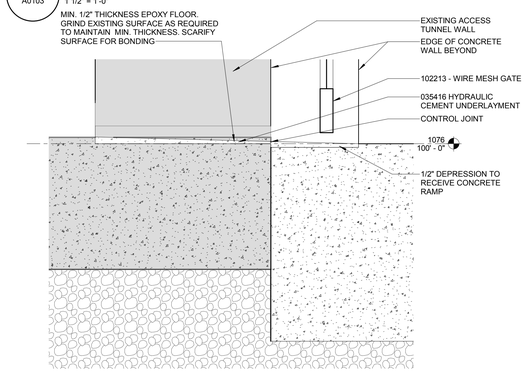
6 A0103 — SECTION RTBT ACCESS TUNNEL/PPU RTBT STUB
1 1/2" = 1'-0"



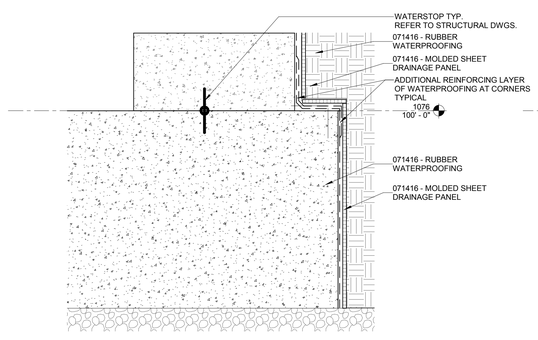
4 A0331 — TYPICAL WALL/ROOF
1 1/2" = 1'-0"



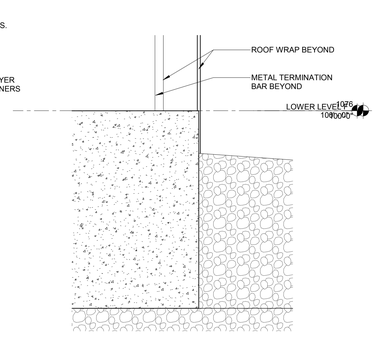
2 A0331 — DETAIL AT ROOF EDGE
1 1/2" = 1'-0"



5 A0421 — PEDESTRIAN OPENING BASE SECTION
1 1/2" = 1'-0"



3 A0331 — RTBT STUB TYPICAL BASE
1 1/2" = 1'-0"



1 A0331 — DETAIL AT SLAB EDGE
1 1/2" = 1'-0"

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

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REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---	REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK									

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

CURT DOUGLAS FINEFROCK — REGISTERED ARCHITECT — No. 10574 — STATE OF TENNESSEE

REV.	DATE	DRAWING APPROVALS
		RPE
		DSN M. MICHILINI
		DRW A. BELTRAN
		CHK J. HOWARD
		DEPT
		PE M. BUCHANAN
		PJ MARK CONNELL
		REQ TBD
		UTB

A/E DRAWING NUMBER
A0422

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PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

DETAILS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	A	X	X	8	8200	1	1	1	P	U

51	52	53		REV
NC	NA		WBS 1.8.3.2	

ABBREVIATIONS

A/C	AIR CONDITIONING	CA	COMPRESSED AIR	D	DRAIN OR DRYER	EWB	ENTERING WET BULB TEMPERATURE	H	HUMIDISTAT OR HUMIDIFIER	M	MOTOR OPERATOR	PH	PHASE	3SF	3 HOUR SMOKE FIRE DAMPER
A/E	ARCHITECT/ENGINEER	CAP	CAPACITY	DB	DECIBEL OR DRY BULB TEMPERATURE	EWT	ENTERING WATER TEMPERATURE	HC	HEATING COIL	MAINT	MAINTENANCE	PLBG	PLUMBING	TC	TEMPERATURE CONTROL
AAV	AUTOMATIC AIR VENT (VALVE)	CC	COOLING COIL	DDC	DIRECT DIGITAL CONTROL	EXH	EXHAUST	HEPA	HIGH EFFICIENCY PARTICULATE AIR FILTER	MAU	MAKE-UP AIR UNIT	PRESS	PRESSURE	TD	TRANSFER DUCT
ABV	ABOVE	CCW	COUNTER CLOCKWISE	DEG.F	DEGREE FAHRENHEIT	EX	EXISTING	HG	HOT GAS	MAX	MAXIMUM	PROP	PROPELLER	TEMP	TEMPERATURE
ACCU	AIR-COOLED CONDENSING UNIT	CD	CONDENSATE DRAIN	DEMO	DEMOLISH	EXIST	EXISTING	HL	HIGH LIMIT	MBH	THOUSAND BTU PER HOUR	PRV	PRESSURE REDUCING VALVE	TL	TOTAL LOAD
ACH	AIR CHANGES PER HOUR	CENTRIF	CENTRIFUGAL	DG	DOOR GRILLE	EXT	EXTERNAL	HORIZ	HORIZONTAL	MCC	MOTOR CONTROL CENTER	PSF	POUNDS PER SQUARE FOOT	TO	TRANSFER OPENING
ACU	AIR CURTAIN	CF	CUBIC FEET	DIA	DIAMETER			HP	HORSEPOWER OR HIGH PRESSURE	MECH	MECHANICAL	PSI	POUNDS PER SQUARE INCH	TSP	TOTAL STATIC PRESSURE
AD	ACCESS DOOR	CFH	CUBIC FEET PER HOUR	DIAG	DIAGONAL	F	FAHRENHEIT	HPR	HIGH PRESSURE CONDENSATE RETURN	MERV	MINIMUM EFFICIENCY REPORTING VALUE	PSIA	POUNDS PER SQUARE IN ABSOLUTE	TSTAT	THERMOSTAT
AF	AIR FOIL FAN	CFM	CUBIC FEET PER MINUTE	DIFF	DIFFUSER	F&T	FLOAT & THERMOSTATIC STEAM TRAP	HPS	HIGH PRESSURE STEAM	MEZZ	MEZZANINE	PSIG	POUNDS PER SQUARE IN GAUGE	TU	TERMINAL UNIT
AFF	ABOVE FINISHED FLOOR	CH	CABINET HEATER	DIM	DIMENSION	F.D.	FLOOR DRAIN	HR	HOUR	MFR	MANUFACTURER			TYP	TYPICAL
AFMS	AIR FLOW MEASURING STATION	CHR	CHILLER	DISCH	DISCHARGE	FA	FREE AREA	HRC	HEAT RECOVERY COIL	MIN	MINIMUM	QTY	QUANTITY		
AHU	AIR HANDLING UNIT	CHWR	CHILLED WATER RETURN	DN	DOWN	FC	FORWARD CURVED	HT	HEIGHT	MISC	MISCELLANEOUS			UGRD	UNDERGROUND
ALT	ALTERNATE	CHWS	CHILLED WATER SUPPLY	DP	DIFFERENTIAL PRESSURE	FCU	FAN COIL UNIT	HTG	HEATING	MPR	MEDIUM PRESSURE CONDENSATE RETURN	R	RETURN	UH	UNIT HEATER (HYDRONIC OR STEAM)
ALUM	ALUMINUM	CI	CAST IRON	DPDT	DOUBLE POLE, DOUBLE THROW	FD	FIRE DAMPER	HTWR	HIGH TEMPERATURE WATER RETURN	MPS	MEDIUM PRESSURE STEAM	RA	RETURN AIR	UNO	UNLESS NOTED OTHERWISE
AMP	AMPERE	CL	CENTER LINE	DPST	DOUBLE POLE, SINGLE THROW	FF	FINAL FILTER	HTWS	HIGH TEMPERATURE WATER SUPPLY	MTD	MOUNTED	RAD	RADIATION	UPS	UNINTERUPTIBLE POWER SUPPLY
AP	ACCESS PANEL	CLG	COOLING	DTR	DUAL TEMPERATURE RETURN	FH	FUME HOOD	HUM	HUMIDIFIER			RAF	RETURN AIR FAN	UV	UNIT VENTILATOR
APD	AIR PRESSURE DROP	CO	CLEAN OUT	DTS	DUAL TEMPERATURE SUPPLY	FLA	FULL LOAD AMPERES	HVAC	HEAT, VENTILATION, & AIR CONDITIONING	N.C.	NORMALLY CLOSED	REBAL	REBALANCE		
APPROX	APPROXIMATE	CO2	CARBON DIOXIDE	DWDI	DOUBLE WIDTH, DOUBLE INLET	FLEX	FLEXIBLE	HVU	HEATING & VENTILATING UNIT	N.O.	NORMALLY OPEN	REG	REGISTER	V	VOLT OR VENT
ARCH	ARCHITECT/ARCHITECTURAL	COMP	COMPRESSOR	DWG	DRAWING	FLR	FLOOR	HWR	HOT WATER RETURN	NC	NOISE CRITERIA	REV	REVISED	VAV	VARIABLE AIR VOLUME
AS	AIR SEPARATOR	CONC	CONCRETE	DX	DIRECT EXPANSION	FLT	FLASH TANK	HWS	HOT WATER SUPPLY	NIC	NOT IN CONTRACT	RH	RELATIVE HUMIDITY	VD	VOLUME DAMPER
ATD	AIR TRANSFER DUCT	CONN	CONNECTION			FM	FLOW METER	HX	HEAT EXCHANGER	NO. OR #	NUMBER	RHC	REHEAT COIL	VEL	VELOCITY
AUTO	AUTOMATIC	CONST	CONSTRUCTION	E/P	ELECTRIC-PNEUMATIC	FOG	FUEL OIL GAUGE	HZ	HERTZ	NR	NOT REQUIRED	RHG	REFRIGERANT HOT GAS	VERT	VERTICAL
AVG	AVERAGE	CONT	CONTINUOUS, CONTINUATION	EA	EXHAUST AIR	FOR	FUEL OIL RETURN			NTS	NOT TO SCALE	RL	REFRIGERANT LIQUID	VI	VIBRATION ISOLATION
AWT	AVERAGE WATER TEMPERATURE	CONTR	CONTRACTOR	EAT	ENTERING AIR TEMPERATURE	FOS	FUEL OIL SUPPLY	ID	INSIDE DIAMETER	NV	NATURAL VENTILATION	RM	ROOM	VIF	VERIFY IN FIELD
AXF	AXIAL FAN	CONV	CONVECTOR	EBB	ELECTRIC BASEBOARD HEATER	FOV	FUEL OIL VENT	IN OR "	INCHES			RO	RELIEF OPENING	VOL	VOLUME
		CP	CONTROL PANEL	EC	EXPANSION COMPENSATOR/JOINT	FP	FIRE PROTECTION	IN W.C.	INCHES WATER COLUMN	OA	OUTSIDE AIR	RP	RADIANT PANEL	VR	VACUUM RETURN
BB	BASEBOARD RADIATION	CT	COOLING TOWER	ECWR	EQUIPMENT COOLING WATER RETURN	FPB	FAN POWERED TERMINAL UNIT	IN W.G.	INCHES WATER GAUGE	OAI	OUTSIDE AIR INTAKE	RPM	REVOLUTIONS PER MINUTE	VRV	VARIABLE REFRIGERANT VOLUME
BDD	BACK DRAFT DAMPER	CU	CONDENSING/ER UNIT	ECWS	EQUIPMENT COOLING WATER SUPPLY	FPM	FEET PER MINUTE	INSUL	INSULATION	OBD	OPPOSED BLADE DAMPER	RS	REFRIGERANT SUCTION	VSD	VARIABLE SPEED DRIVE
BF	BOILER FEED WATER	CU FT	CUBIC FEET	EDB	ENTERING DRY BULB TEMPERATURE	FPS	FEET PER SECOND	INT	INTERNAL	OED	OPEN END DUCT	RTU	ROOF TOP UNIT	VTR	VENT THROUGH ROOF
BG	BOTTOM GRILLE (3"-12" ABOVE FLOOR)	CV	CONSTANT VOLUME	EER	ENERGY EFFICIENCY RATIO	FR	FINNED RADIATION			OFCI	OWNER FURNISHED/CONTRACTOR INSTALLED	RV	REFRIGERANT VENT OR RELIEF VALVE (VENT)		
BHP	BRAKE HORSEPOWER	CV	CONSTANT VOLUME	EF	EXHAUST FAN	FSTAT	FREEZESTAT	KW	KILOWATT	OFOI	OWNER FURNISHED/OWNER INSTALLED	RV	RETURN AIR VALVE	W	WATT
BLDG	BUILDING	CWR	CONDENSER WATER RETURN	EFF	EFFICIENCY	FT	FEET	KWH	KILOWATT HOUR	OH	OVERHEAD			W.G.	WATER GAGE
BMS	BUILDING MANAGEMENT SYSTEM	CWS	CONDENSER WATER SUPPLY	EHC	ELECTRIC HEATING COIL	FV	FACE VELOCITY			OPNG	OPENING	S/W	SUMMER-WINTER	W/	WITH
BOD	BOTTOM OF DUCT			ELELEV	ELEVATION			LAT	LEAVING AIR TEMPERATURE			SA	SUPPLY AIR OR SOUND ATTENUATOR	W/O	WITHOUT
BR	BOTTOM REGISTER (3"-12" ABOVE FLOOR)			ELEC	ELECTRIC/ELECTRICAL	G	NATURAL GAS	LBS	POUNDS	ΔP/DP	DIFFERENTIAL PRESSURE	SCR	SILICON CONTROLLED RECTIFIER	WB	WET BULB TEMPERATURE
BSMT	BASEMENT			ELEM	ELEMENT	GA	GAUGE	LDB	LEAVING DRY BULB TEMPERATURE	P	PUMP	SD	SMOKE DETECTOR	WC	WATER COLUMN
BTU	BRITISH THERMAL UNIT			ELEV	ELEVATOR	GAL	GALLON	LF	LINEAR FEET	P/E	PNEUMATIC-ELECTRIC SWITCH	SENS	SENSIBLE LOAD	WMS	WIRE MESH SCREEN
BTUH	BRITISH THERMAL UNIT PER HOUR			EMD	END OF MAIN DRIP (STEAM)	GCWR	GEOTHERMAL CONDENSER WATER RETURN	LP	LOW PRESSURE	PA	PASCAL	SF	SMOKE-FIRE DAMPER	WPD	WATER PRESSURE DROP
				EMER	EMERGENCY	GCWS	GEOTHERMAL CONDENSER WATER SUPPLY	LPG	LIQUID PETROLEUM GAS	PCD	PUMPED CONDENSATE DISCHARGE/RETURN	SHT	SHEET	WT	WEIGHT
				ENG	ENGINEER	GD	GRAVITY DAMPER	LPR	LOW PRESSURE CONDENSATE RETURN	PCF	POUNDS PER CUBIC FOOT	SM	SMOKE DAMPER	WTR	WATER
				ENT	ENTERING	GPH	GALLONS PER HOUR	LPS	LOW PRESSURE STEAM	PCWR	PROCESSED CHILLED WATER RETURN	SOL	SOLENOID		
				ERP	ELECTRIC RADIANT PANEL	GPM	GALLONS PER MINUTE	LRA	LOCKED ROTOR AMPERES	PCWS	PROCESSED CHILLED WATER SUPPLY	SP	STATIC PRESSURE		
				ESP	EXTERNAL STATIC PRESSURE	GR	GLYCOL RETURN	LVG	LEAVING	PD	PRESSURE DROP	SQ	SQUARE		
				EST	ESTIMATE	GRL	GRILLE	LVR	LOUVER	PF	PROPELLER FAN	SQ. FT.	SQUARE FEET		
				ET	EXPANSION TANK	GRV	GRAVITY RELIEF VENT	LWB	LEAVING WET BULB TEMPERATURE	PG	PRESSURE GAUGE	SS	STAINLESS STEEL		
				ETO	ETHYLENE OXIDE	GS	GLYCOL SUPPLY	LWT	LEAVING WATER TEMPERATURE			STD	STANDARD		
				EUH	ELECTRIC UNIT HEATER	GV	GRAVITY VENTILOR OR NATURAL GAS VENT					STL	STEEL		
				EV	EXHAUST AIR VALVE							STM	STEAM		
				EVAP	EVAPORATOR							STRUC	STRUCTURE/STRUCTURAL		
				EVF	FUME HOOD EXHAUST AIR VALVE							SV	SUPPLY AIR VALVE		
				EVL	LAB EXHAUST AIR VALVE							SWSI	SINGLE WIDTH, SINGLE INLET		

SYMBOLS

- SUPPLY DUCT RISE
- RETURN DUCT RISE
- EXHAUST DUCT RISE
- SUPPLY DUCT DROP
- RETURN DUCT DROP
- EXHAUST DUCT DROP
- NEW DUCT
- EXISTING DUCT
- DEMOED DUCT
- CAPPED DUCTWORK
- DUCT OFF-SET DN (IN DIRECTION OF FLOW)
- DUCT OFF-SET UP (IN DIRECTION OF FLOW)
- RECTANGULAR DUCT DIMENSIONS (SIZE IN INCHES, FIRST DIMENSION IS SHOWN)
- ROUND DUCT DIMENSIONS (DIAMETER)
- OVAL DUCT DIMENSIONS (SIZE IN INCHES, FIRST DIMENSION IS SHOWN)
- CAPPED PIPING OR SINGLE DUCTWORK
- SINGLE LINE SUPPLY DUCT
- SINGLE LINE RETURN DUCT
- SINGLE LINE EXHAUST DUCT
- EXISTING SINGLE LINE DUCT
- EXISTING ITEM TO BE REMOVED
- SINGLE LINE DUCT RISE OR DROP
- ELBOW WITH TURNING VANES
- FLEXIBLE DUCT
- OPPOSED BLADE VOLUME DAMPERS
- VOLUME DAMPER
- FIRE, SMOKE/FIRE, OR SMOKE DAMPER IN RISER
- FIRE, SMOKE/FIRE, OR SMOKE DAMPER
- MOTORIZED DAMPER
- BACKDRAFT DAMPER

- TEMPERATURE SENSOR (IN DUCT OR PIPE)
- RECTANGULAR WYE DUCT FITTING
- POINT OF CONNECTION (NEW TO EXISTING)
- NEW HVAC PIPE
- EXISTING HVAC PIPE
- EXISTING HVAC PIPE TO BE REMOVED
- PIPE ELBOW DOWN
- PIPE ELBOW UP
- PIPE RISE OR DRAW
- PIPE BOTTOM DROP
- ROUND (DIAMETER)
- CONTROL VALVE (2-WAY)
- CONTROL VALVE (3-WAY)
- TRIPLE DUTY VALVE
- CHECK VALVE (SHOWN W/FLOW)
- BALANCING VALVE
- SOLENOID VALVE
- PRESSURE REDUCING VALVE
- SAFETY/RELIEF VALVE
- VALVE
- UNION
- HOSE DRAIN VALVE WITH CAP
- MANUAL AIR VENT
- CLEANOUT (CO)
- PRESSURE/TEMPERATURE TEST PORT
- EXPANSION JOINT
- EXPANSION LOOP
- STRAINER W/BLOWDOWN VALVE
- PIPING FLOW METER
- TRAP
- FLEXIBLE CONNECTION
- PIPE GUIDE
- DIRECTION OF FLOW
- PIPE ANCHOR

- PUMP
- MOTOR CONTROLLER/DISCONNECT, 3'-8" AFF
- ELECTRICAL CONNECTION (BY DIVISION 23)
- ELECTRICAL CONNECTION (BY DIVISION 26)
- SENSING ELEMENT - AIR STREAM
- SENSING ELEMENT - LIQUID SEPARABLE WELL
- TEMPERATURE SENSOR
- THERMOSTAT WITH LOCKING COVER
- HUMIDITY SENSOR
- SWITCH
- OCCUPANCY SENSOR
- PUSH BUTTON
- CARBON DIOXIDE SENSOR
- OXYGEN SENSOR
- FLOW SWITCH
- DIFFERENTIAL PRESSURE TRANSMITTER
- RELAY
- FREEZESTAT
- PNEUMATIC-ELECTRIC SWITCH G - GREEN Y - YELLOW R - RED
- ELECTRIC-PNEUMATIC PILOT LIGHT- LETTER INDICATES COLOR:
- VARIABLE SPEED DRIVE
- FIRESTAT
- SMOKE DETECTOR
- ANALOG INPUT, TEMPERATURE
- ANALOG INPUT, PRESSURE
- ANALOG INPUT, FLOW
- ANALOG INPUT
- ANALOG OUTPUT
- DIGITAL OUTPUT
- DIGITAL INPUT
- ANALOG OUTPUT, PNEUMATIC

- ROOM PRESSURIZATION MONITOR
- DUCT SMOKE DETECTOR
- AIR FLOW MEASURING STATION
- CURRENT SENSOR
- STARTER
- SUPPLY AIR DEVICE - (REFER TO SCHEDULE FOR SIZE) FIRST NO. CFM, SECOND NO. TYPE (REFER TO SPECIFICATION FOR AIR DEVICE TYPE)
- RETURN AIR DEVICE - (REFER TO SCHEDULE FOR SIZE) FIRST NO. CFM, SECOND NO. TYPE (REFER TO SPECIFICATION FOR AIR DEVICE TYPE)
- EXHAUST AIR DEVICE - (REFER TO SCHEDULE FOR SIZE) FIRST NO. CFM, SECOND NO. TYPE (REFER TO SPECIFICATION FOR AIR DEVICE TYPE)
- SUPPLY/ RETURN/EXHAUST SIDEWALL GRILLE- FIRST NO. CFM, SECOND NO. TYPE BOTTOM NO. WIDTH BY HEIGHT OF GRILLE (REFER TO SPECIFICATION FOR AIR DEVICE TYPE)
- LINEAR DIFFUSER (CFM / TYPE / SLOT WIDTH (INCHES) / NO. OF SLOTS / LENGTH)
- NEW EQUIPMENT (TYPE NO. / EQUIPMENT TYPE)
- EXISTING EQUIPMENT (EXISTING / EQUIPMENT TYPE)
- CALLOUT INDICATOR TOP INDICATES NUMBER ON THE SHEET BOTTOM INDICATES SHEET NUMBER
- SECTION INDICATOR TOP INDICATES SECTION NUMBER BOTTOM INDICATES SHEET NUMBER

GENERAL NOTES

1. REFER TO ARCHITECTURAL ELEVATION DRAWINGS FOR LOCATION OF WALL MOUNTED MECHANICAL ITEMS.
2. DUCTWORK NOT SIZED IS GENERALLY SMALLER BRANCH ZONE DUCTS. COORDINATE ELEVATIONS AND PROVIDE NECESSARY OFFSETS.
3. PROVIDE VOLUME DAMPERS AT ALL SUPPLY, RETURN AND EXHAUST DUCT BRANCH TAKE-OFFS. SEE DUCT CONSTRUCTION DETAILS.
4. INSTALL RIGID 1"x1" GALVANIZED STEEL WIRE MESH AT ALL OPEN ENDED DUCTS IN OCCUPIED AREAS OR EXPOSED TO VIEW.
5. COORDINATE SCHEDULE FOR HOOKUPS TO EXISTING SYSTEM AND REMOVAL OR RELOCATION OF EQUIPMENT WITH THE OWNER. PERFORM THIS WORK AT SUCH TIMES TO ENSURE THAT PERIODS OF SHUTDOWN WILL BE ACCEPTABLE TO THE OWNER.
6. VERIFY EXACT LOCATION OF CONNECTION POINTS (NEW TO EXISTING) IN FIELD PRIOR TO CONSTRUCTION.
7. COORDINATE INSTALLATION OF NEW DUCTWORK AND PIPING WITH BUILDING STRUCTURE, DUCTWORK, PIPING, ELECTRICAL CONDUIT, LIGHTING, ETC.
8. PATCH ALL WALLS, FLOORS, CEILINGS, AND ROOFS TO MATCH EXISTING IN ALL CASES WHERE EXISTING WALLS, FLOORS, CEILINGS AND ROOFS REMAIN AND HVAC DEMOLITION IS INDICATED.
9. PROVIDE POSITIVE DRAINAGE OF ALL PLENUMS CONNECTED TO OUTSIDE LOUVERS. WATERPROOF BOTTOM OF PLENUMS. SLOPE PLENUM BOTTOM TO LOUVER OR PROVIDE DRAIN POINTS WITH DISCHARGE TO DRAIN.

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
DSN	AK
DRW	AK
CHK	DF
DEPT	
PE	
PJ	MARK CONNELL
REQ	TBD
REV.	DATE
UTB	

DRAWING APPROVALS

A/E DRAWING NUMBER
M0001

UT-BATTELLE
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under U.S. GOVERNMENT contract DE-AC05-00OR22725

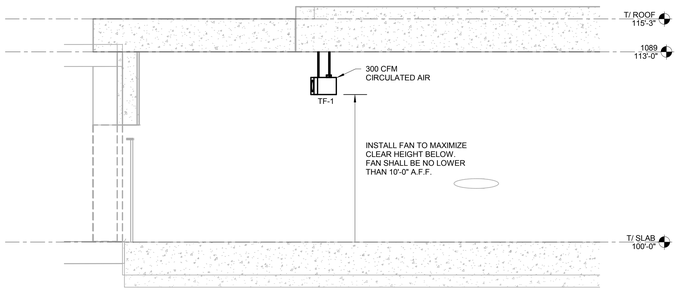
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

SYMBOLS, ABBREVIATIONS, AND GENERAL NOTES

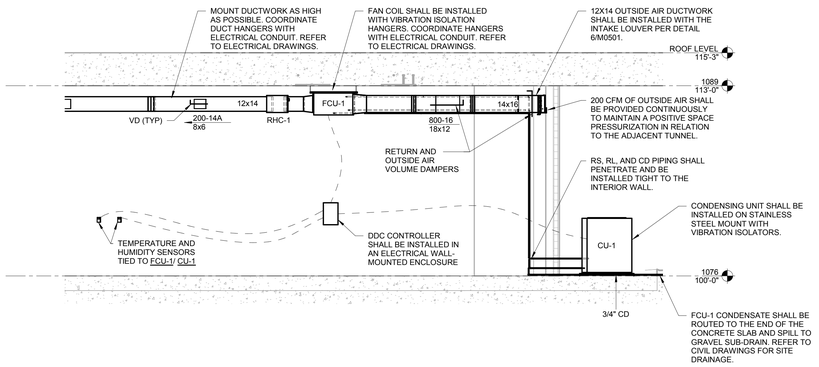
1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	H	X	X	8	8200	1	1	1	P	U
51		52		53	WBS					REV
NC		NA			1.8.3.2					

REMOVE AND RELOCATE EXISTING AUXILIARY FIRE HOSE VALVE PIPING AND HANGERS TO ACCOMMODATE OPENINGS IN TUNNEL WALLS. MOVE VALVE TO A LOCATION EAST OF THE NEW OPENING. MATCH EXISTING INSTALLATION HEIGHT.

4 FIRE PROTECTION PIPING RELOCATION
NTS



3 TRANSFER FAN SECTION
1/4" = 1'-0"



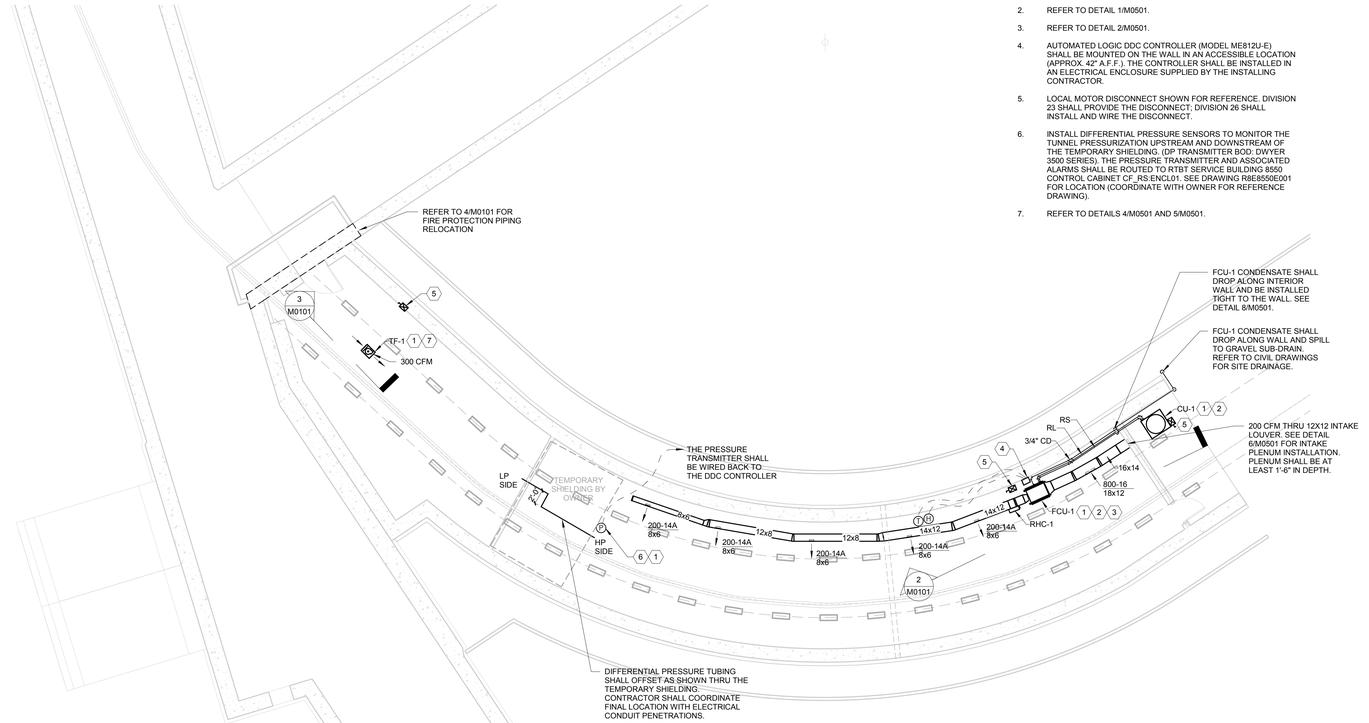
2 FAN COIL AND CONDENSING UNIT SECTION
1/4" = 1'-0"

GENERAL NOTES:

1. REFER TO BRANCH DUCTWORK SCHEDULE ON M0001.
2. REFRIGERANT PIPE SIZES SHALL BE COORDINATED WITH THE SPLIT SYSTEM MANUFACTURER. REFER TO SPECIFICATION SECTION 232300.
3. REFER TO ARCHITECTURE PLANS AND SPECIFICATIONS FOR EXTERIOR INTAKE LOUVER.
4. REFER TO SPECIFICATION SECTION 233713 FOR DIFFUSER AND GRILLE INFORMATION.
5. LOCATE EXISTING REINFORCING PRIOR TO DRILLING HOLES FOR POST-INSTALLED ANCHORS. THE CONTRACTOR SHALL NOT CUT OR DAMAGE EXISTING REINFORCING DURING ANCHOR INSTALLATION.

NOTES:

1. EQUIPMENT SHALL BE TIED INTO THE EXISTING EPICS SYSTEM.
2. REFER TO DETAIL 1/M0501.
3. REFER TO DETAIL 2/M0501.
4. AUTOMATED LOGIC DDC CONTROLLER (MODEL ME812U-E) SHALL BE MOUNTED ON THE WALL IN AN ACCESSIBLE LOCATION (APPROX. 42" A.F.F.). THE CONTROLLER SHALL BE INSTALLED IN AN ELECTRICAL ENCLOSURE SUPPLIED BY THE INSTALLING CONTRACTOR.
5. LOCAL MOTOR DISCONNECT SHOWN FOR REFERENCE. DIVISION 23 SHALL PROVIDE THE DISCONNECT; DIVISION 26 SHALL INSTALL AND WIRE THE DISCONNECT.
6. INSTALL DIFFERENTIAL PRESSURE SENSORS TO MONITOR THE TUNNEL PRESSURIZATION UPSTREAM AND DOWNSTREAM OF THE TEMPORARY SHIELDING. (DP TRANSMITTER BOD: DWYER 3500 SERIES). THE PRESSURE TRANSMITTER AND ASSOCIATED ALARMS SHALL BE ROUTED TO RTBT SERVICE BUILDING 8550 CONTROL CABINET CF. RS:ENCL01. SEE DRAWING RBE8550E001 FOR LOCATION (COORDINATE WITH OWNER FOR REFERENCE DRAWING).
7. REFER TO DETAILS 4/M0501 AND 5/M0501.



1 LEVEL 01 - HVAC DUCTWORK AND PIPING PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
0' 4' 8' 16' 32'

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																									

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK | DRAWING APPROVALS

CERTIFIED FOR CONSTRUCTION
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RPE	
DSN	AK
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PE	
PJ	MARK CONNELL
REQ	TBD
UTB	

KEITH RICHARD HAMMAN — REGISTERED ENGINEER — ARCHITECTURE — STATE OF TENNESSEE — 7/11/19

A/E DRAWING NUMBER
M0101

UT-BATTELLE
Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under
U.S. GOVERNMENT contract DE-AC05-00OR22725
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PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

LEVEL 01 - HVAC DUCTWORK AND PIPING PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	H	X	X	8	8200	1	1	1	P	U
51		52		53						REV
NC		NA			WBS 1.8.3.2					

AC SPLIT SYSTEM SCHEDULE - FAN COIL UNIT

TAG	AREA SERVED	CONFIGURATION	FAN			DX COIL COOLING CAPACITY							REFRIGERANT		ECM ELECTRICAL DATA							UNIT WEIGHT	UNIT DIMENSIONS (LxWxH) (IN)	MANUFACTURER	MODEL	REMARKS
			CFM	ESP (IN WG)	TSP (IN WG)	NOMINAL TONS	TOTAL MBH	SENSIBLE MBH	EAT (F)		LAT (F)		MAX APD (IN WG)	TYPE	CHARGE	BHP	HP	V	PH	HZ	MCA	FLA					
									DB	WB	DB	WB														
FCU-1	RTBT STUB	HORIZONTAL	1,000	0.65	1.45	3.1	37.7	24.1	82.3	70	60.4	58.7	0.68	R410A	9 LBS., 13 OZ.	0.411	1	460	3	60	3.13	2.5	130	33.72x28x18	TRANE	BCHD024	1 - 5

REMARKS:
1. BAS CONTRACTOR SHALL PROVIDE WALL MOUNTED DDC CONTROLLER (ALC MODEL ME812U-E) AND TEMPERATURE/HUMIDITY COMBINATION SENSOR. CONTROLLER SHALL BE INSTALLED IN A NEMA 1 ELECTRICAL ENCLOSURE.
2. MANUFACTURER SHALL INCLUDE 1" FILTER.
3. MANUFACTURER SHALL PROVIDE MOTOR STARTER. INSTALLED BY ELECTRICAL CONTRACTOR.
4. MANUFACTURER SHALL PROVIDE VIBRATION ISOLATION.
5. REFER TO ELECTRIC REHEAT COIL SCHEDULE FOR FAN COIL HEATING CAPACITY.

AC SPLIT SYSTEM SCHEDULE - CONDENSING UNIT

TAG	LOCATION	UNIT SERVED	CAPACITY (TONS)	FANS		COMPRESSOR			ELECTRICAL					REFRIGERANT		MANUFACTURER	MODEL	REMARKS
				QTY	HP	QTY	RLA	LRA	V	PH	HZ	MCA	MOCP	TYPE	CHARGE			
CU-1	GRADE	FCU-1	3	1	0.125	1	5.7	38	460	3	60	8	15	R410A	9 LBS., 13 OZ.	TRANE	4TTA7036A4000A	1,2,3

REMARKS:
1. MANUFACTURER TO PROVIDE STARTER/DISCONNECT. INSTALLED BY ELECTRICAL CONTRACTOR.
2. MANUFACTURER TO PROVIDE MOUNTING BASE (MIN. OF 2" HEIGHT) AND VIBRATION ISOLATION.
3. MANUFACTURER TO INCLUDE HOT-GAS BYPASS VALVE AND SEQUENCING (BASIS OF DESIGN: RAWAL APR VALVE).

ELECTRIC REHEAT COIL SCHEDULE

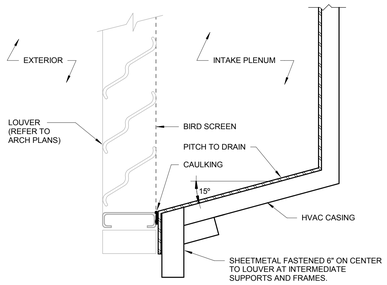
TAG	ASSOCIATED EQUIPMENT	AIRFLOW (CFM)	MAX FACE VELOCITY (FPM)	MAX AIR P.D. INCH W.C.	ROWS	EAT (°F)	LAT (°F)	TOTAL CAP. (KW)	COIL DIMENSION (WXH) (IN.)	ELECTRICAL		MANUFACTURER	MODEL	REMARKS
										(V/PH/HZ)	FLA			
RHC-1	FCU-1	1,000	855	0.05	2	54.6	73.4	6.0	14X12	480/3/60	7.2	THERMOLEC	C2CACNT0P6M2ICX6B1A1SC	1 - 5

REMARKS:
1. PROVIDE MAGNETIC CONTACTOR.
2. INTEGRAL AIR FLOW SENSOR.
3. PROVIDE S.C.R. AND CONTROL BOX.
4. PROVIDE DISCONNECT SWITCH.
5. PROVIDE FUSIBLE LINK.

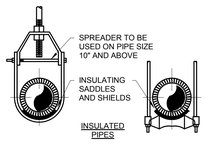
TRANSFER FAN SCHEDULE

TAG	AREA SERVED	AIRFLOW CFM	S.P. IN WC	FAN DATA			VFD	MOTOR DATA						MANUFACTURER	MODEL	REMARKS
				FAN TYPE	RPM	DRIVE		BHP	HP	FLA	VOLT	PH	HZ			
TF-1	RTBT STUB	300	0.25	INLINE CENTRIFUGAL	1172	DIRECT	N	0.03	0.1	2.6	115	1	60	GREENHECK	SQ-90-VG	1 - 6

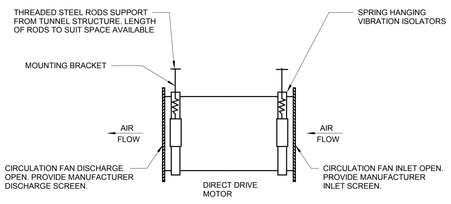
REMARKS :
1. VIBRATION ISOLATION
2. HIGH EFFICIENCY MOTOR
3. 1/2" INSULATED HOUSING
4. INLET/ OUTLET GUARD
5. PROVIDE MOTOR STARTER. ELECTRICAL CONTRACTOR SHALL INSTALL.
6. PROVIDE DISCONNECT SWITCH. ELECTRICAL CONTRACTOR SHALL INSTALL.



6 INTAKE LOUVER TO PLENUM CONNECTION
NTS

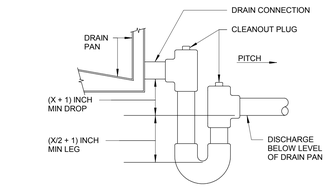


10 PIPE SUPPORT AND HANGER DETAIL
NTS



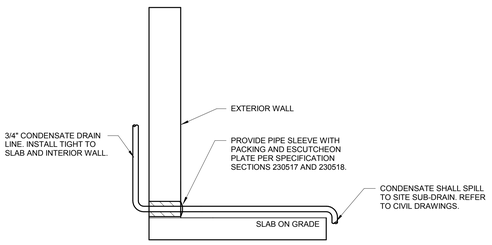
NOTES:
1. MOTOR LOCATION / ORIENTATION SHALL BE COORDINATED BY CONTRACTOR FOR READY ACCESS.
2. LOCATE EXISTING REINFORCING PRIOR TO DRILLING HOLES FOR POST-INSTALLED ANCHORS. THE CONTRACTOR SHALL NOT CUT OR DAMAGE EXISTING REINFORCING DURING ANCHOR INSTALLATION.
3. REFER TO SPECIFICATION SECTION 233423.

5 CIRCULATION FAN DETAIL
NTS

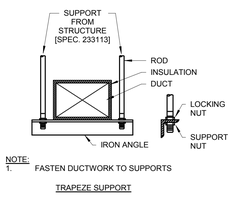


NOTES:
1. X= SUCTION PRESSURE IN SECTION (NEGATIVE INTERNAL S.P. IN INCHES WC)
2. FOR FAN COIL UNITS X= 1" WC

9 FAN COIL UNIT CONDENSATE DRAIN P-TRAP DETAIL
NTS



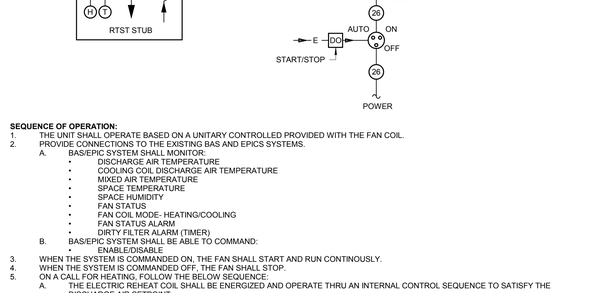
8 OUTSIDE CONDENSATE DRAIN DETAIL
NTS



NOTE:
1. FASTEN DUCTWORK TO SUPPORTS

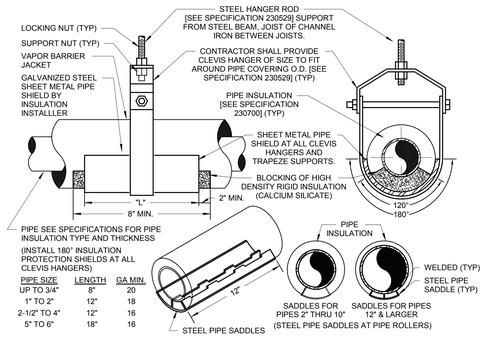
TRAPEZE SUPPORT

7 DUCTWORK SUPPORT DETAIL
NTS



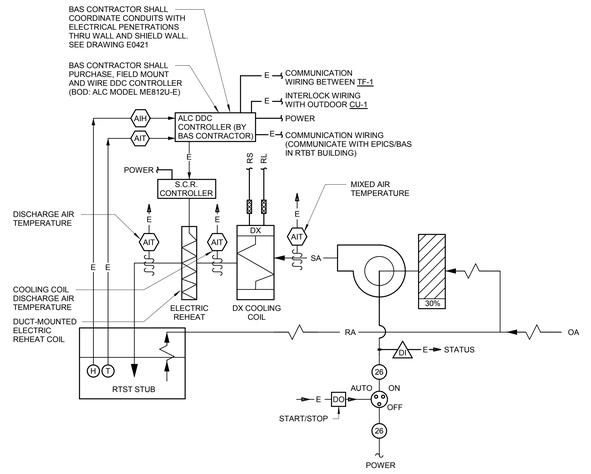
SEQUENCE OF OPERATION:
1. FAN RUN STATUS: THE UNIT SHALL OPERATE BASED ON A CURRENT SWITCH WIRED BACK TO SPARE INPUTS AVAILABLE ON THE DDC-CONTROLLER FOR FCU-1/CU-1.
2. FAN ENABLE/DISABLE: THE DDC-CONTROLLER FOR FCU-1/CU-1 SHALL USE A SPARE DIGITAL OUTPUT TO PROVIDE REMOTE ENABLE AND DISABLE OF THE FAN.
   A. WHEN THE FAN IS ENERGIZED, THE FAN SHALL TURN ON AND RUN CONTINUOUSLY.
   B. WHEN THE FAN IS DEENERGIZED, THE FAN SHALL TURN OFF.

4 CIRCULATION FAN CONTROL DIAGRAM
NTS



INSTALL 360° INSULATION PROTECTION SHIELDS AT ALL PIPING SECURED WITH U-BOLTS AND U-CLAMPS. PROVIDE HIGH DENSITY INSULATION SUPPORTS AT ALL CLEVIS HANGERS, SUPPORTS AND TRAPEZE HANGERS.PROVIDE STEEL PIPE INSULATION SADDLES ON ALL PIPES SUPPORTED BY ROLLERS.

3 PIPE COVERING PROTECTION SHIELDS & PIPE SADDLES
NTS

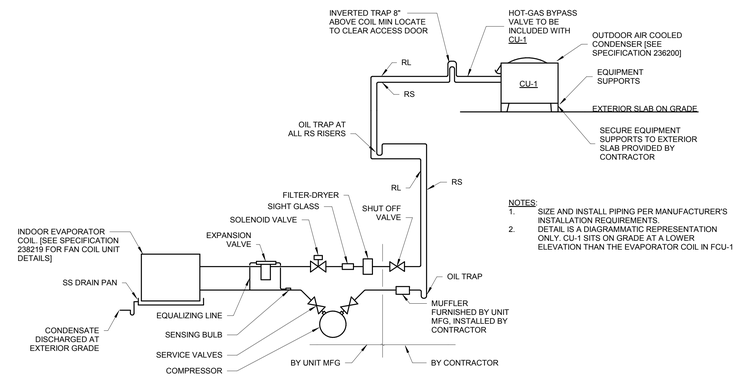


SEQUENCE OF OPERATION:
1. THE UNIT SHALL OPERATE BASED ON A UNITARY CONTROLLED PROVIDED WITH THE FAN COIL.
2. PROVIDE CONNECTIONS TO THE EXISTING BAS AND EPICS SYSTEMS.
   A. BAS/EPIC SYSTEM SHALL MONITOR:
      - DISCHARGE AIR TEMPERATURE
      - COOLING COIL DISCHARGE AIR TEMPERATURE
      - MIXED AIR TEMPERATURE
      - SPACE TEMPERATURE
      - SPACE HUMIDITY
      - FAN STATUS
      - FAN COIL MODE- HEATING/COOLING
      - FAN STATUS ALARM
      - DIRTY FILTER ALARM (TIMER)
   B. BAS/EPIC SYSTEM SHALL BE ABLE TO COMMAND:
      - ENABLE/DISABLE
3. WHEN THE SYSTEM IS COMMANDED ON, THE FAN SHALL START AND RUN CONTINOUSLY.
4. WHEN THE SYSTEM IS COMMANDED OFF, THE FAN SHALL STOP.
5. ON A CALL FOR HEATING, FOLLOW THE BELOW SEQUENCE:
   A. THE ELECTRIC REHEAT COIL SHALL BE ENERGIZED AND OPERATE THRU AN INTERNAL CONTROL SEQUENCE TO SATISFY THE DISCHARGE AIR SETPOINT.
   B. THE DX COOLING COIL SOLENOID VALVE SHALL BE CLOSED AND THE CONDENSING UNIT SHALL BE DE-ENERGIZED.
   C. ON A REDUCTION IN HEATING REQUIREMENTS, THE ELECTRICAL REHEAT COIL SHALL BE DE-ENERGIZED.
6. ON A CALL FOR COOLING, FOLLOW THE BELOW SEQUENCE:
   A. THE DX COOLING COIL SOLENOID VALVE SHALL OPEN.
   B. THE ASSOCIATED CONDENSING UNIT SHALL START AND OPERATE THRU AN INTERNAL CONTROL SEQUENCE.
   C. THE ELECTRIC REHEAT COIL SHALL BE DE-ENERGIZED.
   D. ON A REDUCTION IN COOLING REQUIREMENTS, AN INTERNAL CONTROL SEQUENCE SHALL DE-ENERGIZE THE CONDENSING UNIT AND CLOSE THE COOLING COIL SOLENOID VALVE.
7. DEHUMIDIFICATION CONTROL
   A. IF THE RELATIVE HUMIDITY MEASURED IN THE SPACE EXCEEDS 50% R.H. (ADJ) CONTINUOUSLY FOR A PERIOD OF FIVE MINUTES (ADJ) THE COOLING COIL DISCHARGE AIR SETPOINT SHALL BE RESET TO 60F (ADJ). THE HEATING SEQUENCE SHALL BE ENABLED TO SATISFY THE DISCHARGE AIR SETPOINT. RETURN TO NORMAL OPERATION AFTER FIVE MINUTES (ADJ) OF CONTINUOUS SPACE HUMIDITY BELOW 50% R.H. (ADJ).
8. ALARMS AND NOTIFICATIONS:
   A. FAN STATUS
   B. FILTER MAINTENANCE (TIMER)
   C. DISCHARGE AIR TEMPERATURE

CONTROLS CONTRACTOR RESPONSIBILITIES:
THE CONTROLS CONTRACTOR SHALL BE RESPONSIBLE FOR THE FOLLOWING SCOPE OF WORK.
1. INSTALL STAND-ALONE DDC CONTROLS SYSTEM. SNS WILL INTEGRATE THE CONTROLLER INTO THE EXISTING EPICS SYSTEM.
2. DDC-CONTROLLER PROGRAMMING.
3. PROVIDE A COPY OF THE DDC-CONTROLLER LOGIC TO SNS.
4. PROVIDE A CONTROLS DRAWING PACKAGE (AUTOCAD) LISTING INSTALLATION DETAILS, INSTRUMENT DETAILS, INSTRUMENT PRODUCT DATA, PANEL LAYOUT, PANEL ENCLOSURE. I\O TERMINATION, AND BILL OF MATERIALS. THE CONTRACTORS CONTROL DESIGN PACKAGE SHALL BE REVIEWED AND APPROVED BY SNS PRIOR TO INSTALLATION.
5. USE SNS APPROVED CABLE TYPES AND SIGNAL TYPES. COORDINATE WITH OWNER.
6. COMMISSIONING THE AUTOMATION.

PRODUCT SPECIFICATIONS:
1. ALL ZONE/ WALL SENSORS USED FOR LOCAL TEMPERATURE, HUMIDITY, AND/OR IAQ SHALL BE AUTOMATED LOGIC BASE MODEL ZS SERIES OR APPROVED EQUAL. THE SENSOR SHALL HAVE A LOCAL DISPLAY WITH ADJUSTABLE SET POINTS FOR CONTROL. BASIS OF DESIGN: ZS2PF-H-ALC.
2. DUCT-MOUNTED TEMPERATURE TRANSMITTERS SHALL BE STATUS INSTRUMENTS BRAND, BASE SERIES SEM710 OR APPROVED EQUAL WITH DIGITAL READOUT.
3. PRESSURE TRANSMITTERS SHALL BE DWYER 3500 SERIES OR APPROVED EQUAL.
4. DDC-CONTROLLER SHALL BE AUTOMATED LOGIC MODEL ME812U-E.

2 FAN COIL UNIT CONTROL DIAGRAM
NTS



NOTES:
1. SIZE AND INSTALL PIPING PER MANUFACTURER'S INSTALLATION REQUIREMENTS.
2. DETAIL IS A DIAGRAMMATIC REPRESENTATION ONLY. CU-1 SITS ON GRADE AT A LOWER ELEVATION THAN THE EVAPORATOR COIL IN FCU-1.

1 REFRIGERANT PIPING DETAIL
NTS

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

REV.	DATE	DRAWING APPROVALS
		RPE
		DSN AK
		DRW AK
		CHK DF
		DEPT
		PE
		PJ MARK CONNELL
		REQ TBD
		UTB

A/E DRAWING NUMBER
M0501

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PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

SCHEDULES, CONTROLS, AND DETAILS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	H	X	X	8	8200	1	1	1	S	U
51		52		53	WBS					REV
NC		NA			1.8.3.2					

DRAWING NOTES AND DESIGNATIONS

- (A) DRAWING KEYED NOTES
- (1) CABLE ROUTING NOTES
- 3004 FEEDER DESIGNATION
- (D) SYMBOL WITH DASHED OUTLINE INDICATES INSTALLATION AT CEILING

WIRE AND CABLE

NEUTRAL WIRE SHOWN AS A LONG LINE; PHASE WIRE SHOWN AS SHORT LINES, AND GROUND WIRE SHOWN AS LONG LINE WITH DOT

- 1 / 1LNL1 — THREE CIRCUIT HOME RUN IN CONDUIT TO ASSOCIATED PANELBOARD. NUMBERS INDICATE CIRCUIT NUMBERS. ARROWS INDICATE QUANTITY OF 20A-1P CIRCUITS. SLASH MARKS INDICATE QUANTITY OF WIRE
- #10 / 30A-2P 1LNL1 — MULTI-CIRCUIT HOME RUN IN CONDUIT TO ASSOCIATED PANELBOARD. SLASH MARKS INDICATE QUANTITY OF WIRES. PHASE WIRE SIZE SHOWN FOLLOWING THE # SYMBOL IF APPLICABLE
- 1LNL1-12 — NUMBERS INDICATES SOURCE PANELBOARD AND CIRCUIT(S)
- SPLICE

LIGHTING BRANCH CIRCUITS

XXX / # / a

- XXX LUMINAIRE TAG - CORRESPONDS TO LUMINAIRE SCHEDULE
- # CIRCUIT NUMBER (AND PANELBOARD IF SPECIFICALLY DESIGNATED)
- a LOWER CASE LETTER(S) INDICATE MULTI-SWITCH CONTROL ARRANGEMENT.

POWER BRANCH CIRCUITS

- # — # CIRCUIT NUMBER (AND PANELBOARD IF SPECIFICALLY DESIGNATED)

WIRING TERMINATIONS

X / a (1)

- X EQUIPMENT IDENTIFICATION TAG.
- # CIRCUIT NUMBER (AND PANELBOARD IF SPECIFICALLY DESIGNATED)

MOTOR CONNECTION. REFER TO EQUIPMENT CONNECTION MOTOR CONTROLLER SCHEDULE FOR SPECIFIC REQUIREMENTS

GROUNDING AND BONDING

- —G— GROUND/ELECTRODE CONDUCTOR
- GROUND ROD
- MECHANICAL CONNECTION
- GROUND CONNECTION (MOLDED FUSION WELD OR IRREVERSIBLE)
- GROUND EQUIP ROOM GROUND TERMINAL BAR OF LENGTH INDICATED, 1'-6" AFF
- GROUND

RACEWAY AND PATHWAY

- CONDUIT TURNED UP
- CONDUIT TURNED DOWN
- CAPPED CONDUIT
- CONDUIT STUBBED AND BUSHED INTO ACCESSIBLE CEILING CAVITY

BRANCH VOLTAGE DROP

CONDUCTOR: AWG	#12	#10	#8
MAXIMUM CONDUCTOR LENGTH AT 120V	95	160	245
MAXIMUM CONDUCTOR LENGTH AT 277V	225	375	565
MAXIMUM CONDUCTOR LENGTH AT 208V-1 PH	170	280	425
MAXIMUM CONDUCTOR LENGTH AT 480V-1 PH	390	650	985
GROUND CONDUCTOR AWG	#12	#10	#8

NOTES:

1. INCREASE BRANCH CIRCUIT CONDUCTOR AS INDICATED.
2. BASED ON 20A CIRCUIT LOADED TO 10A USING SINGLE PHASE, 2 WIRE CIRCUITS.
3. SCHEDULE REPRESENTS MINIMUM CONDUCTOR SIZE BASED ON LENGTH OF BRANCH CIRCUIT CONDUCTOR FROM PANEL TO PHYSICAL CENTER OF LOAD TO OVERCOME VOLTAGE DROP. 3% VOLTAGE DROP ASSUMED.
4. TRANSITION FROM LARGER CONDUCTOR SIZE TO #12 FOR FINAL TERMINATION TO OUTLET DEVICE. PROVIDE JUNCTION BOX WITHIN 10' OF OUTLET. EXTEND #12 CONDUCTOR TO OUTLET.

UNDERGROUND CONSTRUCTION

- DB DUCT BANK

EXISTING PANELBOARDS

- NORMAL BRANCH PANELBOARD
- (EMERGENCY/ NEC 700) BRANCH PANELBOARD

TRANSFORMERS

- T TRANSFORMER (PLAN DENOTATION)

MOTOR CONTROLLERS

- ST FRACTIONAL HORSEPOWER MOTOR CONTROLLER, RECESSED 3'-8" AFF OR ABOVE CEILING (MANUAL THERMAL SWITCH)
- MOTOR CONTROLLER/DISCONNECT, 3'-8" AFF (5'-0" AFF IN EQ ROOMS)
- VSD VARIABLE SPEED DRIVE

BOXES

- J JUNCTION BOX
- PB PULL BOX

WIRING DEVICES

- INDICATES MULTIPLE DEVICES INSTALLED UNDER COMMON COVERPLATE AT ONE LOCATION
- S SINGLE POLE SWITCH, 3'-8" AFF
- S3 3-WAY SWITCH, 3'-8"
- NEMA 5-20R DUPLEX RECEPTACLE, 1'-6" AFF
- G NEMA 5-20R GFCI DUPLEX RECEPTACLE, 3'-8" AFF
- W NEMA 5-20R GFCI DUPLEX RECEPTACLE IN WP BOX WITH WP COVER, 1'-6" AG

INTERIOR LIGHTING

- GEOMETRIC SHAPE LUMINAIRE, RECESSED OR SURFACE
- LUMINAIRE CONNECTED TO UNSWITCHED, EMERGENCY / NEC 700 BRANCH

ILLUMINATED "EXIT" SIGNAGE

- SINGLE LINE - SINGLE FACE (DIRECTION OF ARROWS AS INDICATED)
  DOUBLE LINE - DOUBLE FACE (DIRECTION OF ARROWS AS INDICATED)

EXTERIOR LIGHTING

- BUILDING MOUNTED LUMINAIRE

FIRE ALARM SYSTEMS

- H HORN STROBE, MIN 6'-8"/ MAX 8'-0" AFF (#INDICATES CANDELA)
- F MANUAL PULL STATION, 3'-8" AFF
- H1 HEAT DETECTOR, COMBINATION RATE OF RISE/FIXED 135°F, CEILING MOUNT

'E' SERIES GENERAL NOTES

1. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION AND FINISH SURFACE CONDITIONS OF CEILING, WALL, FLOOR MOUNTED DEVICES.
2. REFER TO ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF FACILITY EXPANSION JOINTS, FIRE RATED WALLS AND SMOKE WALLS
3. VERIFY EXACT LOCATION OF CONNECTION POINTS PRIOR TO CONNECTION.
4. MOUNTING HEIGHTS ARE TO CENTER OF DEVICE EQUIPMENT, UNO.
5. PROVIDE RACEWAY, WIRE AND CABLE, ASSOCIATED FITTINGS AND CONNECTORS, AND COMPLETE CONNECTIONS REQUIRED FOR DESIGNATED BRANCH CIRCUITS FROM DEVICE(S) TO FINAL OVERCURRENT DEVICE AND TO LOCAL CONTROL DEVICE(S) PER SPECIFICATIONS.
6. MINIMUM BRANCH CIRCUIT WIRE SIZE SHALL BE #10. MAINTAIN MAXIMUM BRANCH CIRCUIT CONDUCTOR LENGTHS AS SCHEDULED ON THIS DRAWING.
7. PULL A SEPERATE NUETRAL AND GROUND CONDUCTOR FROM PANELBOARD FOR EACH BRANCH CIRCUIT.
8. CIRCUIT NUMBERS SHOWN FOR EQUIPMENT WIRED TO EXISTING PANELBOARD(S) IS SHOWN FOR DESIGN INTENT ONLY AND MAY NOT CORRESPOND TO ACTUAL CIRCUIT BREAKER MOUNTING POSITION IN THE PANEL. UPDATE THE AS-BUILT DRAWINGS WITH THE ACTUAL CIRCUIT NUMBERS USED TO CORRESPOND TO THE PANEL DIRECTORY.
9. CONFIRM ALL LABELS AND ROOM NUMBERS WITH OWNER PRIOR TO FINALIZING LABELING.
10. COORDINATE FINAL OUTLET LOCATION WITH ALL TRADES AND EQUIPMENT PLACEMENT PRIOR TO ROUGH-IN.

EQUIPMENT DESIGNATIONS

D 4 LC 1

- D BUILDING
- 4 LEVEL
- EQUIPMENT NAME
- SEQUENCE NUMBER
- 1 NUMBERS IN SEQUENCE - 1,2,3, ETC.
- LC LIGHTING CONTACTOR
- 1 LEVEL 01
- RS RING SUPPORT

PANELBOARDS DESIGNATIONS

RS-1P1

- RS BUILDING
- 1 LEVEL
- P TYPE
- 1 SEQUENCE NUMBER
- 1 NUMBERS IN SEQUENCE - 1,2,3, ETC.
- E EMERGENCY LIGHTING PANELBOARD
- L LIGHTING PANELBOARD
- P POWER PANELBOARD
- PP RECEPTACLE PANELBOARD
- 1 SUBSTATION NUMBER
- RS RTBT SERVICE BUILDING

DEVICE SUBSCRIPTS

a	LOWER CASE LETTER(S) INDICATES MULTI SWITCH CONTROL ARRANGEMENT
7	NUMERAL INDICATES BRANCH CIRCUIT NUMBER
ERL	EXISTING TO BE RELOCATED
GFCI	GROUND FAULT CIRCUIT INTERRUPTING RECEPTACLE
GFI	GROUND FAULT CIRCUIT INTERRUPTING BREAKER PROTECTED
L	LOCATOR STYLE SWITCH OPERATING HANDLE
WP	WEATHERPROOF

GENERAL

- NEW EQUIPMENT
- EXISTING WORK
- DEVICE TO BE REMOVED (DEMO PLANS) UNDERFLOOR CONDUIT (NEW PLANS)
- FUTURE WORK
- WIRE AND/OR CONDUIT RUN CONTINUED ON REFERENCED DETAIL
- MATCH LINE REFERENCING CONTINUATION ON OTHER DRAWINGS
- DETAIL AND/OR SECTION REFERENCE
- BRANCH CIRCUIT BOUNDARY

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NUMBER OF SECTION OR DETAIL

DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY

CHANGE CONTROL SYSTEM 3

ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

NOT FOR CONSTRUCTION

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JULY 11, 2019

RPE

DSN	MICHAEL BRINKMAN
DRW	ALEX GIBERSON
CHK	TED FOWLER
DEPT	
PE	EASON
PJ	MARK CONNELL
REQ	TBD
UTB	

REV. DATE — DRAWING APPROVALS

A/E DRAWING NUMBER
E0001

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PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

ELECTRICAL NOTES, LEGENDS, SYMBOLS, AND ABBREVIATIONS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	S	U

51	52	53	WBS	REV
NC	NA		1.8.3.2	

NEXT ASS'Y: FINAL ASS'Y:

BRANCH CIRCUIT NOTES ◇:

1. WIRE LUMINARES AND LIGHT SWITCHES TO EXISTING LIGHTING CIRCUITS SERVING RTBT TUNNEL.

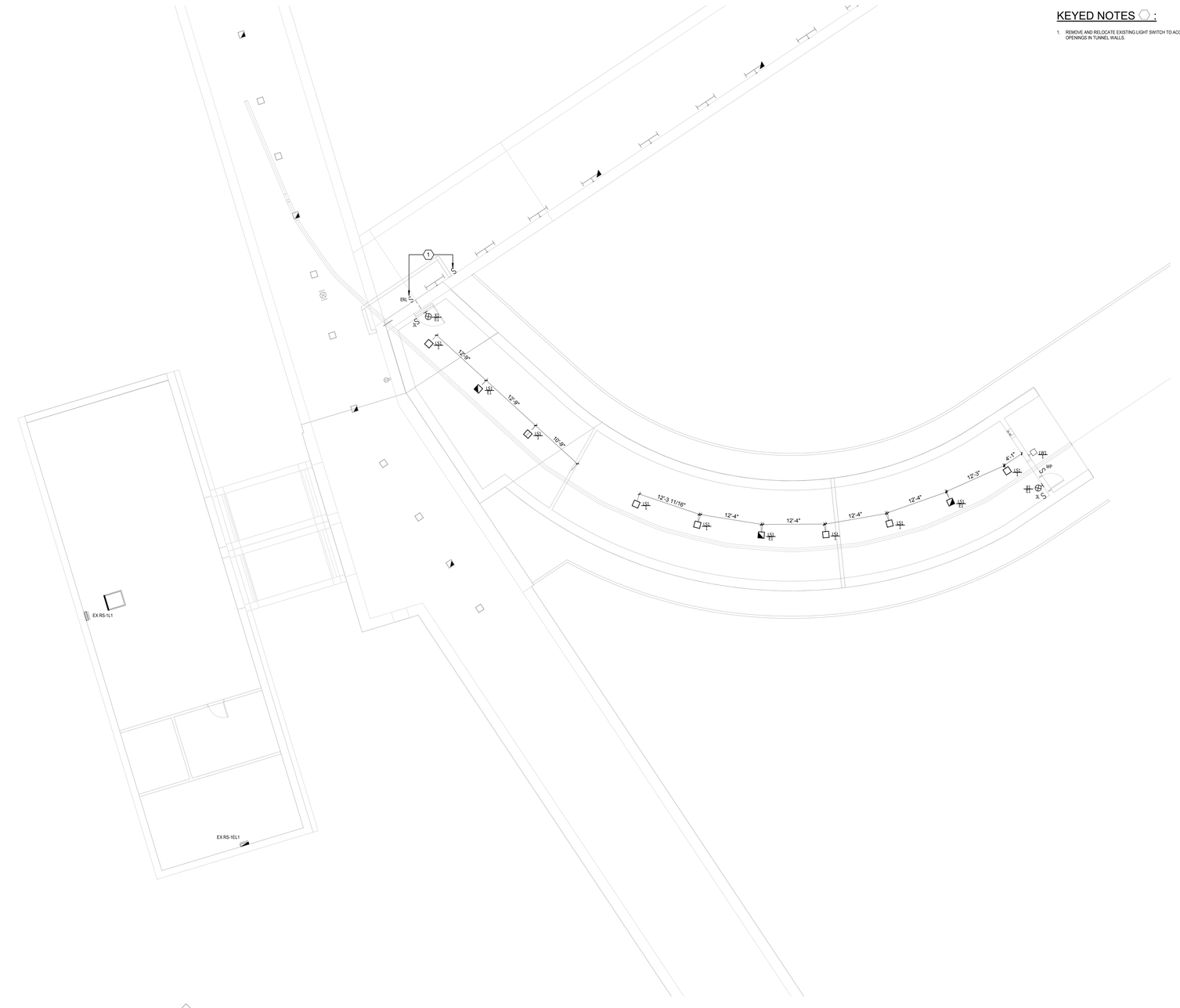
   WIRE LIGHT FIXTURES TAGGED WITH SINGLE LOWER CASE LETTER (EXAMPLE 'b') THROUGH ASSOCIATED LOCAL LIGHT SWITCH.

   WIRE EMERGENCY LIGHT FIXTURES AND EXIT SIGNS (INDICATED WITH AN "E" PREFIX) AHEAD OF LIGHTING CONTROLS, TO EXISTING LIGHTING CIRCUITS SERVING RTBT TUNNEL.

   ABS/10TDU PANELBOARDS
   RS-1EL1, CCT #1 - NORMAL LIGHTING (LOCATED WITHIN RTBT SERVICE BUILDING)
   RS-1EL1, CCT #1 - EMERGENCY LIGHTING (E) (LOCATED WITHIN RTBT SERVICE BUILDING)

KEYED NOTES ⬡:

1. REMOVE AND RELOCATE EXISTING LIGHT SWITCH TO ACCOMODATE OPENINGS IN TUNNEL WALLS.



1 RTBT STUB LIGHTING PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
0' 4' 8' 16' 32'

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NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

THIS DOCUMENT CONTROLLED BY
CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL CAUTION	CHANGE CONTROL NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										
				REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK										

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	
DSN	Designer
DRW	Author
CHK	Checker
DEPT	
PE	EASON
PJ	MARK CONNELL
REQ	TBD
REV.	
DATE	
UTB	

DRAWING APPROVALS

A/E DRAWING NUMBER
E0101

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Oak Ridge National Laboratory
managed for the DEPARTMENT OF ENERGY under
U.S. GOVERNMENT contract DE-AC05-00OR22725
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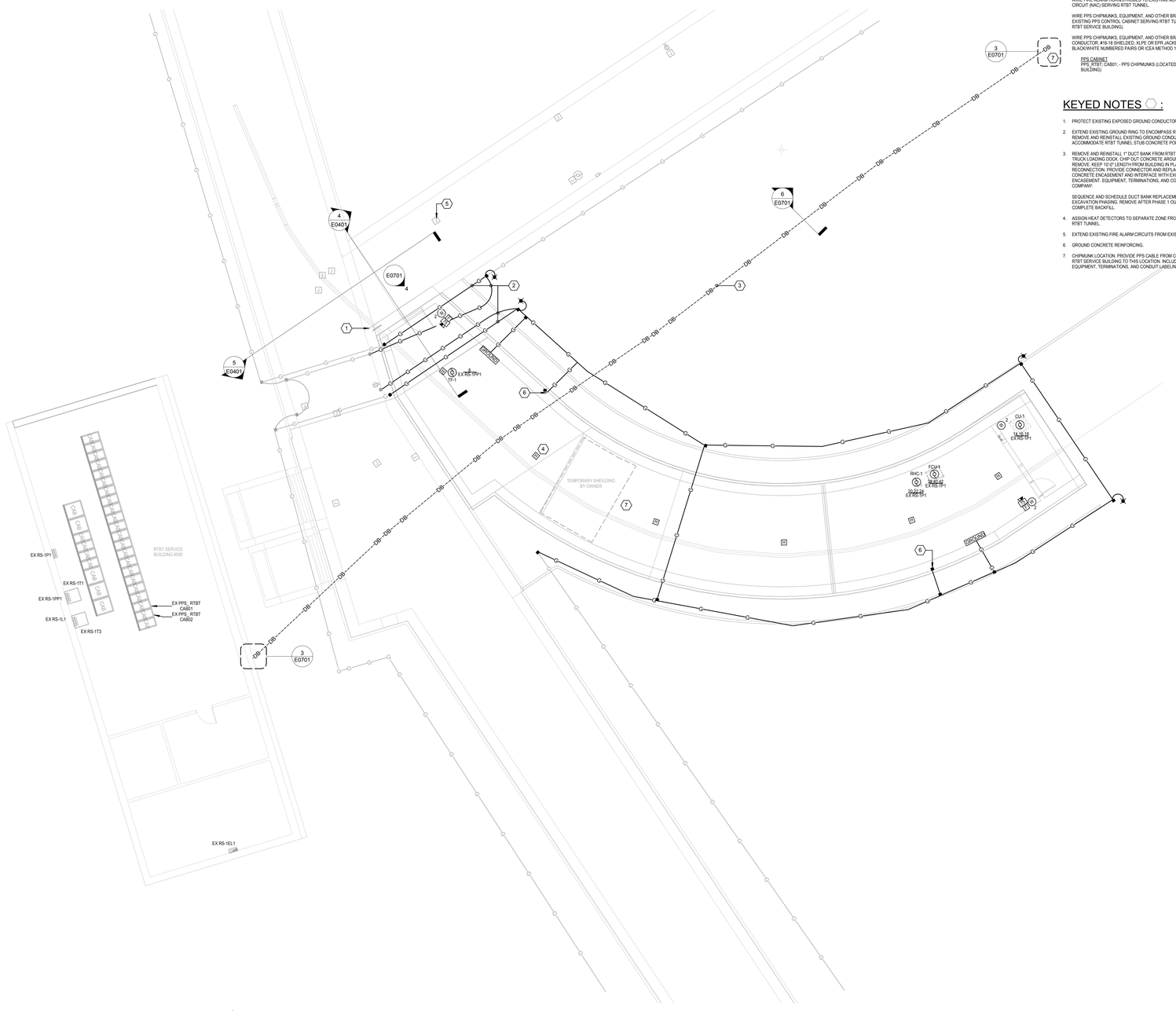
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

LIGHTING PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	P	U

51	52	53		
NC	NA		WBS 1.8.3.2	REV



1 RTBT STUB POWER & SYSTEMS PLAN
1/8" = 1'-0"

SCALE: 1/8" = 1'-0"
0' 4' 8' 16' 32'

BRANCH CIRCUIT NOTES :

1. WIRE MOTORS, EQUIPMENT, AND OTHER BRANCH CIRCUITS AS INDICATED TO PANEL INDICATED IN EQUIPMENT WIRING SCHEDULE UNLESS NOTED OTHERWISE.

   WIRE ELECTRICAL RECEPTACLES, AND OTHER BRANCH CIRCUITS AS INDICATED TO EXISTING RECEPTACLE CIRCUIT SERVING RTBT TUNNEL.

   208Y/120V PANELBOARDS
   RS-1YP1: CCTR2 - NORMAL RECEPTACLES (LOCATED WITHIN RTBT SERVICE BUILDING)

   WIRE FIRE ALARM MANUAL PULL STATIONS AND HEAT DETECTORS TO EXISTING INITIATION DEVICE CIRCUIT (IDC) SERVING RTBT TUNNEL.

   WIRE FIRE ALARM HORN/STROBES TO EXISTING NOTIFICATION APPLIANCE CIRCUIT (NAC) SERVING RTBT TUNNEL.

   WIRE PPS CHIPMUNKS, EQUIPMENT, AND OTHER BRANCH CIRCUITS TO EXISTING PPS CONTROL CABINET SERVING RTBT TUNNEL (LOCATED WITHIN RTBT SERVICE BUILDING).

   WIRE PPS CHIPMUNKS, EQUIPMENT, AND OTHER BRANCH CIRCUITS WITH (8) CONDUCTOR, #16-18 SHIELDED, XLPE OR EPR JACKETED CABLE WITH BLACK/WHITE NUMBERED PAIRS OR ICEA METHOD 1-E2(K2) COLORS.

   PPS CABINET
   PPS_RTBT: CAB01 - PPS CHIPMUNKS (LOCATED WITHIN RTBT SERVICE BUILDING)

KEYED NOTES :

1. PROTECT EXISTING EXPOSED GROUND CONDUCTOR DURING DEMOLITION.
2. EXTEND EXISTING GROUND RING TO ENCOMPASS RTBT TUNNEL STUB. REMOVE AND REINSTALL EXISTING GROUND CONDUCTOR AS REQUIRED TO ACCOMMODATE RTBT TUNNEL STUB CONCRETE POUR.
3. REMOVE AND REINSTALL 1" DUCT BANK FROM RTBT SERVICE BUILDING TO TRUCK LOADING DOCK. CHIP OUT CONCRETE AROUND EXISTING DUCT AND REMOVE. KEEP 15'-0" LENGTH FROM BUILDING IN PLACE AT BOTH ENDS FOR RECONNECTION. PROVIDE CONNECTOR AND REPLACE DUCT. REPOUR CONCRETE ENCASEMENT AND INTERFACE WITH EXISTING CONCRETE ENCASEMENT. EQUIPMENT, TERMINATIONS, AND CONDUIT LABELING ARE BY COMPANY.

   SEQUENCE AND SCHEDULE DUCT BANK REPLACEMENT WITH SITE EXCAVATION PHASING. REMOVE AFTER PHASE 1 OUTAGE, REINSTALL AFTER COMPLETE BACKFILL.
4. ASSIGN HEAT DETECTORS TO SEPARATE ZONE FROM THE REST OF THE RTBT TUNNEL.
5. EXTEND EXISTING FIRE ALARM CIRCUITS FROM EXISTING JUNCTION BOX.
6. GROUND CONCRETE REINFORCING.
7. CHIPMUNK LOCATION. PROVIDE PPS CABLE FROM CONTROL PANEL WITHIN RTBT SERVICE BUILDING TO THIS LOCATION. INCLUDE 20' SERVICE LOOP. EQUIPMENT, TERMINATIONS, AND CONDUIT LABELING ARE BY COMPANY.

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CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

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ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	ADDENDA OR CHANGE NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---	REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS											INTER-DISCIPLINE CHECK									

RPE		
DSN	MICHAEL BRINKMAN	
DRW	ALEX GIBERSON	
CHK	TED FOWLER	
DEPT		
PE	EASON	
PJ	MARK CONNELL	
REQ	TBD	

REV. DATE UTB — DRAWING APPROVALS

A/E DRAWING NUMBER
E0201

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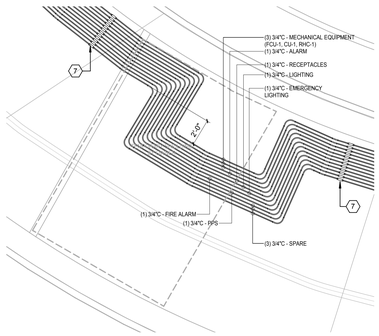
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

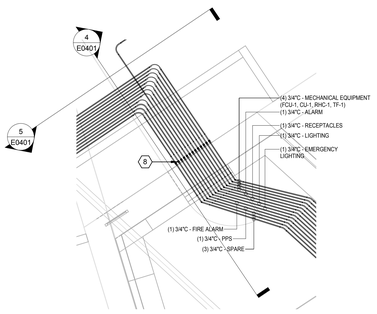
POWER & SYSTEMS PLAN

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	P	U

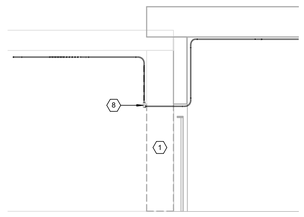
51	52	53		
NC	NA		WBS 1.8.3.2	REV



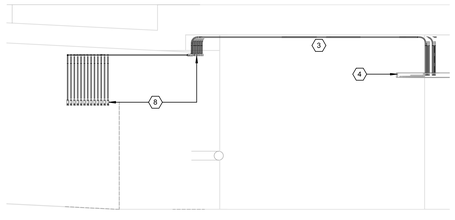
2 CONDUIT THROUGH TEMPORARY SHIELDING
1/4" = 1'-0"



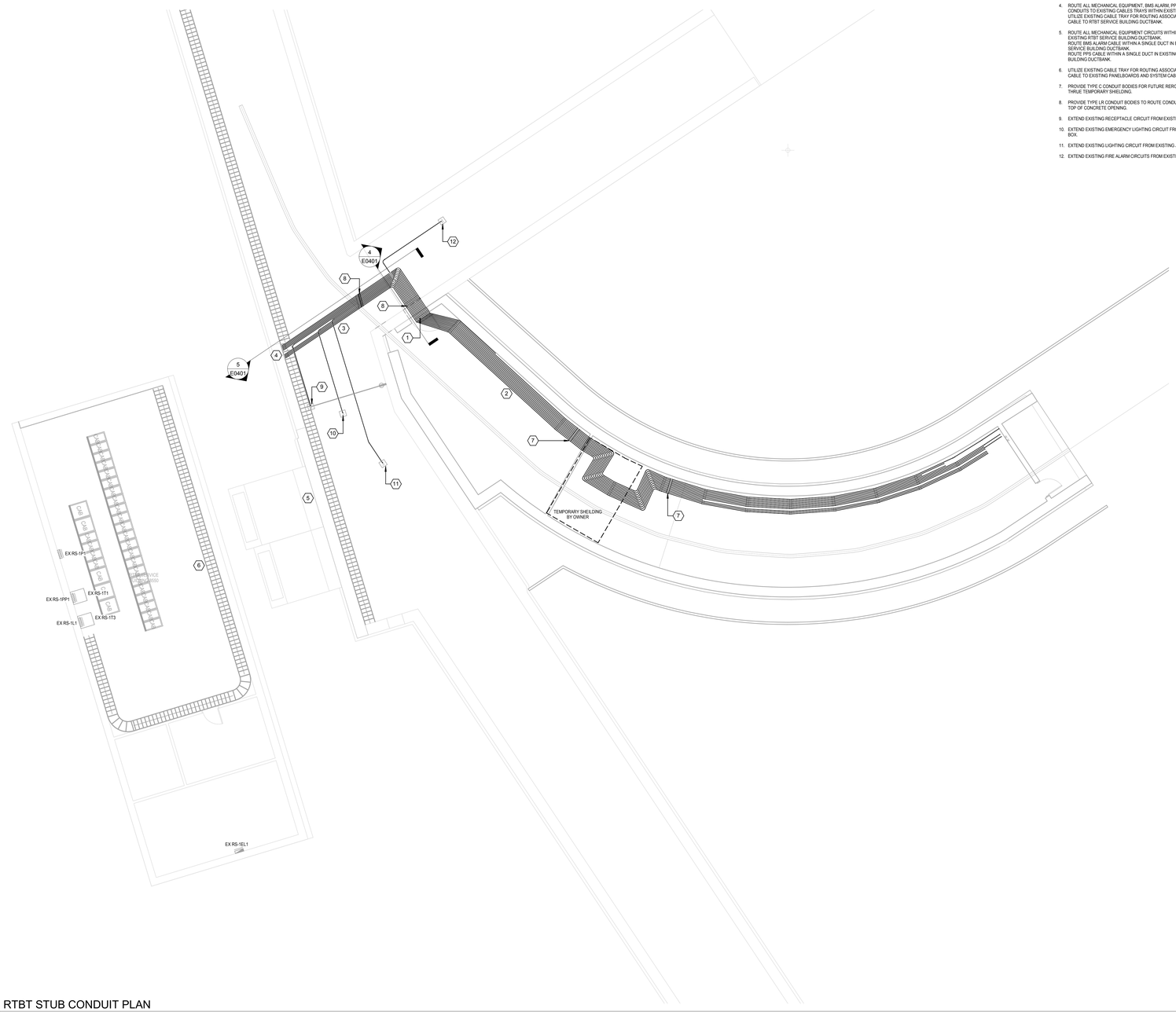
3 CONDUIT THROUGH CONCRETE WALL OPENING
1/4" = 1'-0"



4 CONDUIT THROUGH CONCRETE WALL OPENING
1/4" = 1'-0"



5 CONDUIT THROUGH EXISTING TRUCK DOCK TUNNEL
1/4" = 1'-0"



1 RTBT STUB CONDUIT PLAN
1/8" = 1'-0"

GENERAL NOTES:

A. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND TO DEPTHS THAT AVOID REINFORCING BARS.

KEYED NOTES ⬡ :

1. ROUTE ALL CONDUITS THROUGH TOP OF DOOR ENTRY CUTOUT.
2. ROUTE ALL CONDUITS ALONG INSIDE CURVE OF TUNNEL, ALONG CEILING OF TUNNEL, IN A SINGLE LAYER.
3. ROUTE ALL CONDUITS ALONG CEILING OF TUNNEL IN ASINGLE LAYER, ABOVE EXISTING CRANE RAILS.
4. ROUTE ALL MECHANICAL EQUIPMENT, BMS ALARM, PPS, AND SPARE CONDUITS TO EXISTING CABLES TRAYS WITHIN EXISTING RTBT TUNNEL. UTILIZE EXISTING CABLE TRAY FOR ROUTING ASSOCIATED CIRCUITS AND CABLE TO RTBT SERVICE BUILDING DUCTBANK.
5. ROUTE ALL MECHANICAL EQUIPMENT CIRCUITS WITHIN A SINGLE DUCT IN EXISTING RTBT SERVICE BUILDING DUCTBANK.
   ROUTE BMS ALARM CABLE WITHIN A SINGLE DUCT IN EXISTING RTBT SERVICE BUILDING DUCTBANK.
   ROUTE PPS CABLE WITHIN A SINGLE DUCT IN EXISTING RTBT SERVICE BUILDING DUCTBANK.
6. UTILIZE EXISTING CABLE TRAY FOR ROUTING ASSOCIATED CIRCUITS AND CABLE TO EXISTING PANELBOARDS AND SYSTEM CABINETS.
7. PROVIDE TYPE C CONDUIT BODIES FOR FUTURE REROUTE OF CONDUIT THRUE TEMPORARY SHIELDING.
8. PROVIDE TYPE LR CONDUIT BODIES TO ROUTE CONDUIT TIGHT TO WALL AND TOP OF CONCRETE OPENING.
9. EXTEND EXISTING RECEPTACLE CIRCUIT FROM EXISTING JUNCTION BOX.
10. EXTEND EXISTING EMERGENCY LIGHTING CIRCUIT FROM EXISTING JUNCTION BOX.
11. EXTEND EXISTING LIGHTING CIRCUIT FROM EXISTING JUNCTION BOX.
12. EXTEND EXISTING FIRE ALARM CIRCUITS FROM EXISTING JUNCTION BOX.

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0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	DSN	Michael Brinkman
	DRW	Alex Giberson
	CHK	Ted Fowler
	DEPT	
	PE	EASON
	PJ	MARK CONNELL
	REQ	TBD
REV.	DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
E0401

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PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

CONDUIT PLANS AND ELEVATIONS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	P	U

51	52	53		REV
NC	NA		WBS 1.8.3.2	

Panel: EX RS-1P1

Location: RTBT SERVICE, RS-301 | Volts: 480/277 Wye | A.I.C. Rating (A): 42,000
Supply From: EX RS-1DP1 | Wiring: 3-Phase 4-Wire
Mounting: Surface | Mains Rating (A): 225
Enclosure: Type 1 | Mains Type: MCB
Panel Options:

Remarks	CKT	Description	Poles	Size (A)	A (VA)		B (VA)		C (VA)		Size (A)	Poles	Description	CKT	Remarks
	1	EH-RT-05; RT-103 SECTR 34...	3	20	1,219	4,988					60	3	REC_RTBT RS-303 SECTR 36	2	
	3	--	--	--			1,219	4,988			--	--	--	4	
	5	--	--	--					1,219	4,988	--	--	--	6	
	7	REC_RTBT_TNNL RT-102 SECT...	3	60	4,988	942					20	3	RTBT_RS-301 SECTR 36 MOTO...	8	
	9	--	--	--			4,988	942			--	--	--	10	
	11	--	--	--					4,988	942	--	--	--	12	
	13	REC_RTBT_TNNL RT-102 SECT...	3	60	4,988	693					15	3	CU-1	14	1,2
	15	--	--	--			4,988	693			--	--	--	16	
	17	--	--	--					4,988	693	--	--	--	18	
	19	2-18A CRANES RING_TNNL...	3	60	13,302	2,000					15	3	RCH-1	20	1,2
	21	--	--	--			13,302	2,000			--	--	--	22	
	23	--	--	--					13,302	2,000	--	--	--	24	
	25	Spare	3	30	0	0					30	3	Spare	26	
	27	--	--	--			0	0			--	--	--	28	
	29	--	--	--					0	0	--	--	--	30	
	31	Spare	3	30	0	0					30	3	Spare	32	
	33	--	--	--			0	0			--	--	--	34	
	35	--	--	--					0	0	--	--	--	36	
	37	Space	--	--	0	5,265					30	3	FCU-1	38	1,2
	39	Space	--	--			0	5,265			--	--	--	40	
	41	Space	--	--					0	5,265	--	--	--	42	
				Total Load (VA):	38,385		38,385		38,385						
				Total (A):	139		139		139						

Load Classification	Connected Load	Applied Demand Factor*	Demand Load	Panel Totals	
Electric Heat	6000 VA	125.00%	7500 VA		
Motor	2078 VA	100.00%	2078 VA	Total Connected Load (VA):	115,156
Motor - Largest	15796 VA	125.00%	19745 VA	Total Demand Load (VA):	120,605
Spare	91281 VA	100.00%	91281 VA	Total Connected (A):	139
				Total Demand (A):	145

*Demand factor applied as outlined in Articles 220, 430, and 440 of the National Electrical Code

Remarks:

1. REPLACE EXISTING CIRCUIT BREAKER.
2. TERMINATIONS WITHIN PANELBOARD ARE BY COMPANY.

Panel: EX RS-1EL1

Location: RTBT SERVICE, RS-303 | Volts: 480/277 Wye | A.I.C. Rating (A): 22,000
Supply From: EX RS-1EDP1 | Wiring: 3-Phase 4-Wire
Mounting: Surface | Mains Rating (A): 125
Enclosure: Type 1 | Mains Type: MAB
Panel Options:

Remarks	CKT	Description	Poles	Size (A)	A (VA)		B (VA)		C (VA)		Size (A)	Poles	Description	CKT	Remarks
1	E1	LGT RT-102	1	20	131	0					20	1	Spare	E2	
	E3	LGT RT-102	1	20			1,025	0			20	1	Spare	E4	
	E5	LGT RS-301, 303	1	20					895	125	20	1	LGT TO COMP. BLDG. 8760	E6	
	E7	LGT ELEC RM, COM RM, DI RM	1	20	1,180	0					20	1	Spare	E8	
	E9	Spare	1	20			0	0			20	1	Spare	E10	
	E11	Spare	1	20					0	0	20	1	Spare	E12	
	E13	Space	--	--	0	0					--	--	Space	E14	
	E15	Space	--	--			0	0			--	--	Space	E16	
	E17	Space	--	--					0	0	--	--	Space	E18	
	E19	Space	--	--	0	0					--	--	Space	E20	
	E21	Space	--	--			0	0			--	--	Space	E22	
	E23	Space	--	--					0	0	--	--	Space	E24	
	E25	Space	--	--	0	0					--	--	Space	E26	
	E27	Space	--	--			0	0			--	--	Space	E28	
	E29	Space	--	--					0	0	--	--	Space	E30	
				Total Load (VA):	1,311		1,025		1,020						
				Total (A):	5		4		4						

Load Classification	Connected Load	Applied Demand Factor*	Demand Load	Panel Totals	
Lighting	131 VA	125.00%	164 VA		
Spare	3225 VA	100.00%	3225 VA	Total Connected Load (VA):	3,356
				Total Demand Load (VA):	3,389
				Total Connected (A):	4
				Total Demand (A):	4

*Demand factor applied as outlined in Articles 220, 430, and 440 of the National Electrical Code

Remarks:

1. EXTEND EXISTING CIRCUIT TO FEED EMERGENCY LIGHTING AND EXIT SIGNS.

Panel: EX RS-1L1

Location: RTBT SERVICE, RS-301 | Volts: 480/277 Wye | A.I.C. Rating (A): 22,000
Supply From: EX RS-1T3 | Wiring: 3-Phase 4-Wire
Mounting: Surface | Mains Rating (A): 70
Enclosure: Type 1 | Mains Type: MCB
Panel Options:

Remarks	CKT	Description	Poles	Size (A)	A (VA)		B (VA)		C (VA)		Size (A)	Poles	Description	CKT	Remarks
1	1	LGT RT-102	1	20	299	1,790					20	1	LGT RS-301	2	
	3	LGT RT-102	1	20			2,205	1,770			20	1	LGT RS-301	4	
	5	LGT OUTDOOR VIA RS-1LC1	1	20					625	980	20	1	LGT RS-302, 303, 304	6	
	7	Spare	1	20	0	4,432					20	1	RS-1LC1 LIGHTING CONTACTOR	8	
	9	Spare	1	20			0	0			20	1	Spare	10	
	11	Spare	1	20					0	0	20	1	Spare	12	
	13	Spare	1	20	0	0					20	1	Spare	14	
	15	Space	--	--			0	0			--	--	Space	16	
	17	Space	--	--					0	0	--	--	Space	18	
	19	RS-1ATS1 (PANEL RS-1EDP1)	3	50	11,080	0					--	--	Space	20	
	21	--	--	--			11,080	0			--	--	Space	22	
	23	--	--	--					11,080	0	--	--	Space	24	
	25	Space	--	--	0	0					--	--	Space	26	
	27	Space	--	--			0	0			--	--	Space	28	
	29	Space	--	--					0	0	--	--	Space	30	
				Total Load (VA):	17,601		15,055		12,685						
				Total (A):	65		56		46						

Load Classification	Connected Load	Applied Demand Factor*	Demand Load	Panel Totals	
Lighting	299 VA	125.00%	374 VA		
Spare	45042 VA	100.00%	45042 VA	Total Connected Load (VA):	45,341
				Total Demand Load (VA):	45,416
				Total Connected (A):	55
				Total Demand (A):	55

*Demand factor applied as outlined in Articles 220, 430, and 440 of the National Electrical Code

Remarks:

1. EXTEND EXISTING CIRCUIT TO FEED LIGHTING.

Panel: EX RS-1PP1

Location: RTBT SERVICE, RS-301 | Volts: 120/208 Wye | A.I.C. Rating (A): 22,000
Supply From: EX RS-1T1 | Wiring: 3-Phase 4-Wire
Mounting: Surface | Mains Rating (A): 225
Enclosure: Type 1 | Mains Type: MCB
Panel Options:

Remarks	CKT	Description	Poles	Size (A)	A (VA)		B (VA)		C (VA)		Size (A)	Poles	Description	CKT	Remarks
	1	REC. RTBT_TNNL_SECT 33, 34	1	20	1,000	540					20	1	REC. RTBT_TNNL_SECT 33, 34	2	1,2
	3	REC. RTBT_TNNL_SECT 33, 34	1	20			1,000	1,000			20	1	REC. RTBT_TNNL_SECT 33, 34	4	
	5	REC. RTBT_TNNL_SECT 34	1	20					1,000	1,000	20	1	MOT. DAMPER RT-102, SECT 34	6	
	7	REC. RS-302	1	20	960	312					20	1	TF-1	8	2
	9	REC. RS-302	1	20			1,000	0			20	1	Spare	10	
	11	REC. RS-302	1	20					400	0	20	1	Spare	12	
	13	REC. N.W. RS-301	3	30	2,000	0					20	1	Spare	14	
	15	--	--	--			2,000	0			20	1	Spare	16	
	17	--	--	--					2,000	0	20	1	Spare	18	
	19	REC. RTBT_TNNL_SECT 33	3	30	2,000	2,000					30	3	REC. RTBT_TNNL_SECT 34	20	
	21	--	--	--			2,000	2,000			--	--	--	22	
	23	--	--	--					2,000	2,000	--	--	--	24	
	25	REC. RTBT_TNNL_SECT 33	3	30	2,000	0					30	3	Spare	26	
	27	--	--	--			2,000	0			--	--	--	28	
	29	--	--	--					2,000	0	--	--	--	30	
	31	REC. RTBT RS-301	3	30	2,000	0					30	3	REC. RTBT RS-301	32	
	33	--	--	--			2,000	0			--	--	--	34	
	35	--	--	--					2,000	0	--	--	--	36	
	37	Spare	3	30	0	0					30	3	Spare	38	
	39	--	--	--			0	0			--	--	--	40	
	41	--	--	--					0	0	--	--	--	42	
				Total Load (VA):	12,812		13,000		12,400						
				Total (A):	107		109		103						

Load Classification	Connected Load	Applied Demand Factor*	Demand Load	Panel Totals	
Motor - Largest	312 VA	125.00%	390 VA		
Spare	37360 VA	100.00%	37360 VA	Total Connected Load (VA):	38,212
Receptacle	540 VA	100.00%	540 VA	Total Demand Load (VA):	38,290
				Total Connected (A):	106
				Total Demand (A):	106

*Demand factor applied as outlined in Articles 220, 430, and 440 of the National Electrical Code

Remarks:

1. EXTEND EXISTING CIRCUIT TO FEED RECEPTACLES.
2. TERMINATIONS WITHIN PANELBOARD ARE BY COMPANY.

EQUIPMENT CONNECTION / MOTOR CONTROLLER SCHEDULE

EQUIPMENT DESIGNATION	DESCRIPTION	HP	KW	FLA	NORMAL PWR	EMERGENCY POWER	VOLTAGE	PHASE	CONTROLLER DATA (MOUNTING: PACKAGED / SEPARATE / MCC; TYPE; NEMA SIZE; OVERCURRENT PROTECTIVE DEVICE: MCP / FUSE / RATING; SINGLE PHASE PROTECTION; NEMA ENCLOSURE; WEIGHT(LBS); LOCATION)	LOCAL DISCONNECT SWITCH (OVERCURRENT PROTECTIVE DEVICE: MCP / FUSE / RATING; NEMA ENCLOSURE; WEIGHT(LBS); LOCATION)
CU-1	CONDENSING UNIT	-	-	6.4	X	-	480V	3PH	BY DIVISION 23	BY DIVISION 23
FCU-1	FAN COIL UNIT	-	-	2.5	X	-	480V	3PH	BY DIVISION 23	BY DIVISION 23
RHC-1	REHEAT COIL	-	6	-	X	-	480V	3PH	BY DIVISION 23	BY DIVISION 23
TF-1	TRANSFER FAN	-	-	2.6	X	-	120V	1PH	BY DIVISION 23	BY DIVISION 23

EQUIPMENT DESIGNATION	SOURCE PROTECTIVE DEVICE					WIRING									REMARKS
	TYPE: MCP*	TYPE: FUSE	TYPE: BREAKER	POLE AMPS	PANELBOARD OR MCC	PHASE QUANTITY	PHASE SIZE	NEUTRAL QUANTITY	NEUTRAL SIZE	GROUND QUANTITY	GROUND SIZE	CONDUIT QUANTITY	CONDUIT SIZE	CONNECTION TYPE	
CU-1	-	-	X	15	RS-1P1; CCT 14,16,18	3	#10	-	-	1	#10	1	3/4"	DC	1,2
FCU-1	-	-	X	30	RS-1P1; CCT 38,40,42	3	#10	-	-	1	#10	1	3/4"	DC	1,2
RHC-1	-	-	X	15	RS-1P1; CCT 20,22,24	3	#10	-	-	1	#10	1	3/4"	DC	1,2
TF-1	-	-	X	20	RS-1PP1; CCT 8	1	#10	1	#10	1	#10	1	3/4"	DC	1,2

CONTROLLER TYPE:

- AL ACROSS THE LINE H-O-A
- ALC ACROSS THE LINE COMBINATION DISCONNECT H-O-A
- ALO ACROSS THE LINE COMBINATION DISCONNECT O-A
- RV REDUCED VOLTAGE
- RVC REDUCED VOLTAGE COMBINATION DISCONNECT
- 2S TWO SPEED
- VSD VARIABLE SPEED DRIVE
- TS FRACTIONAL HP MANUAL STARTER

*MINIMUM MOTOR CIRCUIT PROTECTOR (MCP) FRAME SIZE SHALL BE BASED ON LISTED POLE AMPS

GENERAL NOTES:

A. FINAL CONNECTIONS TO ALL EQUIPMENT SHALL BE MADE BY DIVISION 26. INTERCONNECT ALL ASSOCIATED EQUIPMENT ELECTRICAL DEVICES.

B. VERIFY ALL RECEPTACLE TYPES AND BRANCH WIRING WITH EQUIPMENT SUPPLIER FOR COORDINATION OF EQUIPMENT PLUGS AND WIRING PRIOR TO INSTALLATION.

CONNECTION TYPE:

- CP CONTROL PANEL - MAKE DIRECT CONNECTION
- DR STANDARD NEMA 5-20R DUPLEX RECEPTACLE
- JB JUNCTION BOX
- DC DIRECT CONNECTION TO EQUIPMENT
- RC RECEPTACLE TO MATCH EQUIPMENT PLUG

LOCATION:

- NU NEAR UNIT
- OU ON UNIT
- PCU PACKAGE CONTROL UNIT
- MCC MOTOR CONTROL CENTER

REMARKS:

1. CONTROLLER AND DISCONNECT FURNISHED BY DIVISION 23. MOUNT AND WIRE.
2. COMBINE CIRCUITS WITHIN A SINGLE SPARE DUCT FROM RTBT SERVICE BUILDING.

LUMINAIRE SCHEDULE

TAG	DESCRIPTION	INSTALLATION METHOD	DEPTH	LIGHT SOURCE SPEC	LIGHT SOURCE QTY	BALLAST/DRIVER SPEC	BALLAST/DRIVER VOLT	INPUT WATTS	MIN. EFF.	SHIELDING/OPTICS	FEATURES/OPTIONS	REFERENCED PRODUCTS	NOTES
LS1	LOW PROFILE CANOPY	SURFACE	6"	LED 11,000 lm	-	-	277V	86W	-	EXTRUDED POLYCARBONATE DROP LENS	DIE-FORMED COLD ROLLED STEEL HOUSING	LITHONIA - CNY LED SERIES SIGNIFY - "STONOCO" GC40 SERIES EATON - "LUMARK" CLCSLED SERIES	
LW1	WALLPACK	SURFACE WALL	7-1/2"	LED 3000 lm	-	-	277V	28.8W	-	PRISMATIC BOROSILICATE GLASS REFRACTOR, DIE-FORMED ANODIZED ALUMINUM REFLECTOR	CORROSION-RESISTANT DIE CAST ALUMINUM HOUSING, BRONZE PPC FINISH, ONE-PIECE SEALED GASKETING, UL WET LOCATION,	SIGNIFY - "STONOCO" WP SERIES EATON - "LUMARK" WPSLED SERIES LITHONIA - TWR1 LED SERIES	1,2
X1	ILLUMINATED "EXIT" SIGN-AC ONLY	CEILING		LED	-	-	277V	≤ 5W PER FACE	-	STENCIL CUT, CODE SIZE "EXIT" LETTERS & DIRECTIONAL CHEVRON(S)-RED ACRYLIC SHEET BACKING	DIE-CAST ALUMINUM HOUSING-SINGLE/DOUBLE FACE-WITH DIRECTIONAL CHEVRONS AS SHOWN-PAINTED PPC FINISH-COLOR TBS	LITHONIA - "SIGNATURE" LE SERIES DUAL-LITE - "SIEMPRA" SE SERIES SURE-LITES - CAX6 SERIES	1

GENERAL NOTES:

A REFERENCED PRODUCTS ARE INCLUDED HEREIN, OF MANUFACTURERS & PRODUCTS, THAT GENERALLY CONFORM TO THE LUMINAIRE DESIGN INTENTS ESTABLISHED HEREIN, & IN THE PROJECT MANUAL. EQUIVALENT PRODUCTS BY OTHER MANUFACTURERS MAY BE CONSIDERED, PRIOR TO BID.

B DETERMINE SPECIFIC LUMINAIRE PART NUMBERS BASED ON THE REFERENCED PRODUCT SERIES, WRITTEN DESCRIPTIONS & PROJECT MANUAL SPECIFICATIONS.

C INCLUSION HEREIN OF MANUFACTURER'S SERIES &/OR MODEL NUMBERS DOES NOT IMPLY UNCONDITIONAL PRODUCT APPROVAL - MANUFACTURER'S STANDARD PRODUCTS MAY REQUIRE CUSTOM MODIFICATIONS TO MEET THE REQUIREMENTS SPECIFIED HEREIN & IN THE PROJECT MANUAL.

D LISTED SIZES, LAMPING, & TYPES OF LUMINAIRES MAY NOT BE STANDARD PRODUCTS PRODUCED FROM ANY GIVEN MANUFACTURER OR SERIES LISTED. MANUFACTURER'S STANDARD PRODUCTS MAY REQUIRE CUSTOM MODIFICATIONS TO MEET THE DESIGN CRITERIA, DESCRIPTIONS, & REQUIREMENTS SPECIFIED HEREIN & IN THE PROJECT MANUAL.

E ALERT ARCHITECT TO DISCREPANCIES PRIOR TO BID.

ABBREVIATIONS:

CONC	CONCRETE	EXP	EXPOSED	LM/W	LUMENS PER WATT	PPC	POLYESTER POWDER COAT FINISH	S'SPEC	SEMI-SPECULAR
DW	DRYWALL	LG	LAY-IN GRID	NT	NARROW TEE GRID	PRISM	PRISMATIC	SS	STAINLESS STEEL
D/I	DIRECT/INDIRECT	LO-IRI	LOW IRRIDESCENT	PAF	PAINT AFTER FABRICATION	REFL'T	REFLECTOR/REFLECTANCE	TBS	TO BE SELECTED BY ARCH
DLC	DESIGN LIGHTS CONSORTIUM	LM	LUMENS	PARA	PARABOLIC	SP	SPLINE CEILING SYSTEM	UNIV	UNIVERSAL 120-277VAC
EFF	EFFICIENCY/EFFICACY/LM/W	LM/FT	LUMENS PER LINEAR FOOT	PL	PLASTER	SPEC	SPECULAR	WH	WHITE
E...	E...			PKG	PACKAGE				

NOTES:

1. MOUNT AT 10'-0" AFF.
2. PROVIDE INTEGRAL PHOTOCELL.

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SECTION AND DETAIL KEY: NUMBER OF SECTION OR DETAIL / DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN

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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL SYSTEM	CHANGE REQUEST NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										

REVISION OR ISSUE PURPOSE | REVISION OR ISSUE REVIEWERS | INTER-DISCIPLINE CHECK

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE

DSN Michael Brinkman
DRW Alex Giberson
CHK Ted Fowler
DEPT
PE EASON
PJ MARK CONNELL
REQ TBD
UTB

REV. DATE
DRAWING APPROVALS

A/E DRAWING NUMBER
E0601

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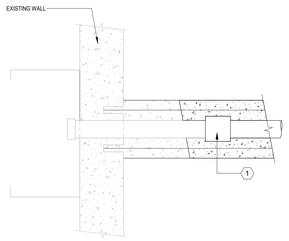
PROJECT NAME:
PPU - RTBT PRELIMINARY AND FINAL DESIGN

ELECTRICAL SCHEDULES

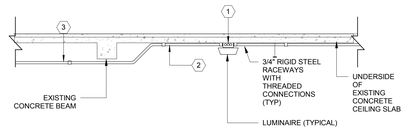
1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	S	U
51	52	53		WBS						REV
NC	NA			1.8.3.2						



KEYED NOTES (#)

1. PRIOR TO SITE EXCAVATION, CHIP OUT CONCRETE AROUND EXISTING DUCT AND REMOVE. KEEP 10'-0" LENGTH FROM BUILDING IN PLACE, AT BOTH ENDS FOR RECONNECTION. PROVIDE CONNECTOR AND REPLACE DUCT. REPOUR CONCRETE ENCASEMENT AND INTERFACE WITH EXISTING CONCRETE ENCASEMENT.

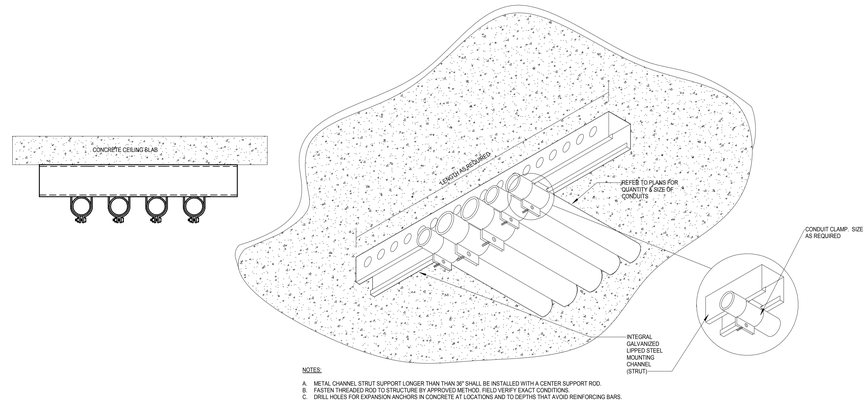
3 DUCTBANK REPLACEMENT
NTS



KEYED NOTES (#)

1. JUNCTION BOX WITH LIGHTING OUTLET CANOPY.
2. ROUTE TIGHT TO UNDERSIDE OF CEILING SLAB TO MAXIMUM EXTENT POSSIBLE.
3. PROVIDE CONDUIT CLAMPS AND SLOTTED METAL CHANNEL FRAMING STYLE SUPPORT MEMBERS TO INDEPENDENTLY SUPPORT LUMINAIRES, RACEWAYS, & THEIR ASSOCIATED ELECTRIC WORK. PROVIDE INTERMEDIATE SUPPORT MEMBERS &/OR FRAMING, AS REQUIRED.

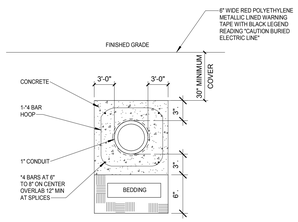
2 LUMINAIRE MOUNTING - EXPOSED CEILING
NTS



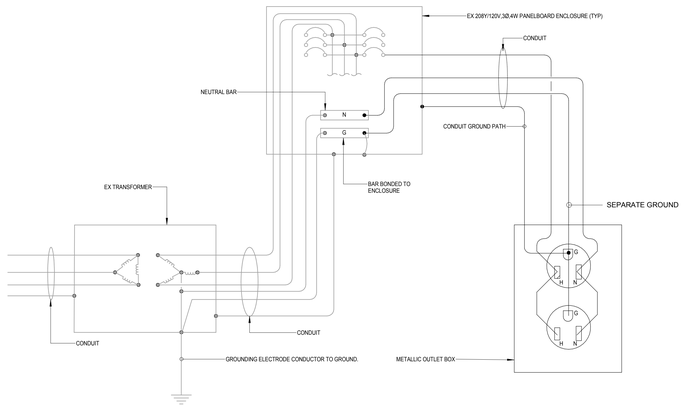
NOTES:

A. METAL CHANNEL STRUT SUPPORT LONGER THAN THAN 36" SHALL BE INSTALLED WITH A CENTER SUPPORT ROD.
B. FASTEN THREADED ROD TO STRUCTURE BY APPROVED METHOD. FIELD VERIFY EXACT CONDITIONS.
C. DRILL HOLES FOR EXPANSION ANCHORS IN CONCRETE AT LOCATIONS AND TO DEPTHS THAT AVOID REINFORCING BARS.

1 CONDUIT MOUNTING DETAIL
NTS



6 REINFORCED DUCT BANK
NTS

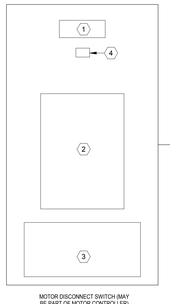


5 BRANCH CIRCUIT GROUND WIRING
NTS

KEYED NOTES (#)

1. REMOVE AND RELOCATE EXISTING LIGHT SWITCH TO ACCOMODATE OPENINGS IN TUNNEL WALLS.
2. PROTECT EXISTING EXPOSED GROUND CONDUCTOR DURING DEMOLITION.

4 RTBT TUNNEL STUB CONNECTION
1/4" = 1'-0"

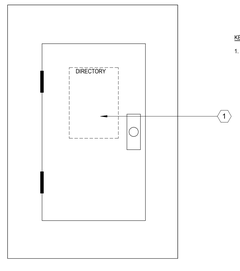


MOTOR DISCONNECT SWITCH (MAY BE PART OF MOTOR CONTROLLER) (FRONT VIEW)

KEYED NOTES (⬡)

1. EQUIPMENT IDENTIFICATION LABEL.
2. WARNING LABEL UNGROUNDED CONDUCTORS (VOLTAGE LABEL).
3. MOTOR DISCONNECT SWITCH WARNING LABEL.
4. TESTING LABEL.

10 MOTOR DISCONNECT IDENTIFICATIONS
NTS

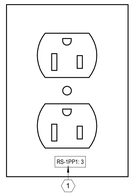


BRANCH CIRCUIT PANELBOARD FRONT VIEW

KEYED NOTES (#)

1. UPDATE EXISTING PANELBOARD CIRCUIT DIRECTORY.

9 PANELBOARD IDENTIFICATIONS
NTS



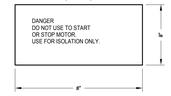
RECEPTACLE (FRONT VIEW)

KEYED NOTES (#)

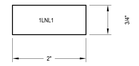
1. SELF-ADHESIVE LABEL ON FACE OF WALL PLATE COVER.

8 RECEPTACLE CIRCUIT IDENTIFICATIONS
NTS

MOTOR DISCONNECT SWITCH WARNING LABEL
(3/8" TEXT)



PROTECTIVE DEVICE LOAD LABEL SAMPLE
(1/4" TEXT)



7 ELECTRICAL IDENTIFICATION LABELS
NTS

NUMBER OF SECTION OR DETAIL
DRAWING ON WHICH SECTION OR DETAIL IS SHOWN OR TAKEN
SECTION AND DETAIL KEY

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CHANGE CONTROL SYSTEM 3
ENGINEERING PROCEDURE

REV	CHANGE TYPE	CHANGE CONTROL LOCATION	ADDENDA OR CHANGE NUMBER	DESCRIPTION	DSN	CHK	DEPT	DATE	PE	DATE	PJ	DATE	REQ	DATE	UTB	DATE	RPE	RPE NO	DATE	ST	CV	EC	EE	EM	IE	M	PD	SE	AR
0	---	4	---																										
REVISION OR ISSUE PURPOSE					REVISION OR ISSUE REVIEWERS															INTER-DISCIPLINE CHECK										

CERTIFIED FOR CONSTRUCTION
JULY 11, 2019

RPE	DSN	Michael Brinkman
	DRW	Alex Giberson
	CHK	Ted Fowler
	DEPT	
	PE	EASON
	PJ	MARK CONNELL
	REQ	TBD
REV.	DATE	UTB

DRAWING APPROVALS

A/E DRAWING NUMBER
E0701

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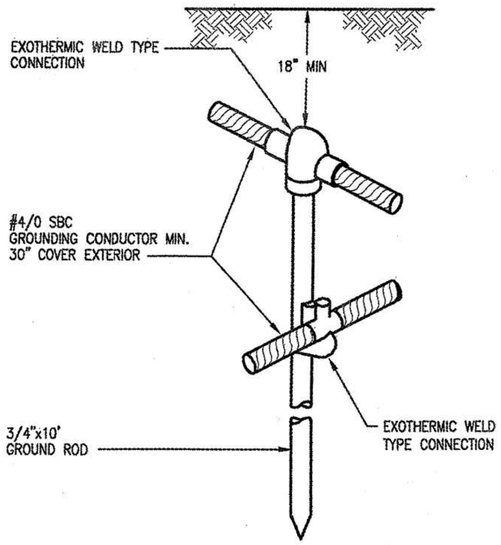
PROJECT NAME
PPU - RTBT PRELIMINARY AND FINAL DESIGN

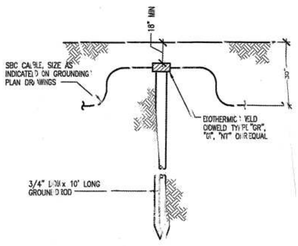
ELECTRICAL DETAILS

1	48	49	50	PLANT	BLDG	FL	SH.	OF	TYPE	CLASS
3	E	X	X	8	8200	1	1	1	D	U

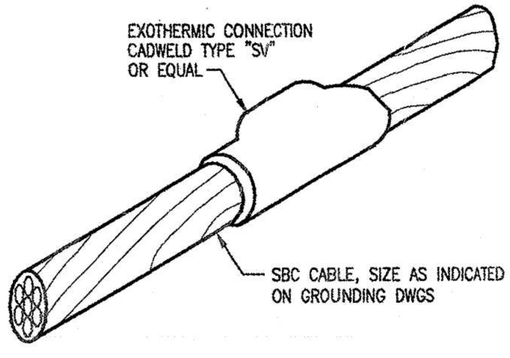
51	52	53	WBS	REV
NC	NA		1.8.3.2	



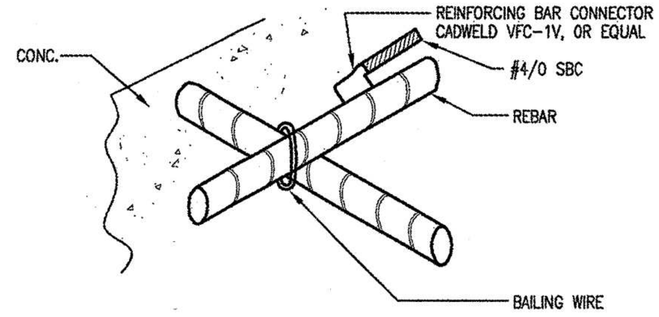
4 GROUND ROD CABLE CONN. DETAIL
1 1/2" = 1'-0"



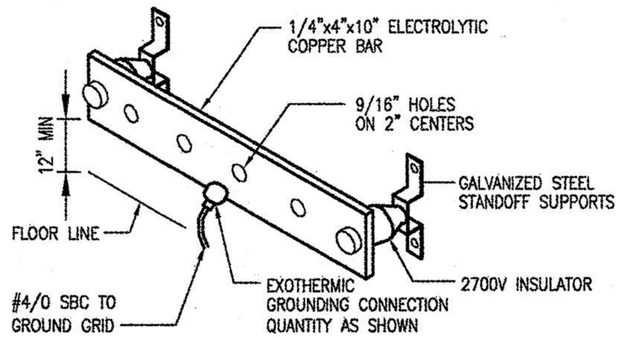
5 GROUND ROD DETAIL
1 1/2" = 1'-0"



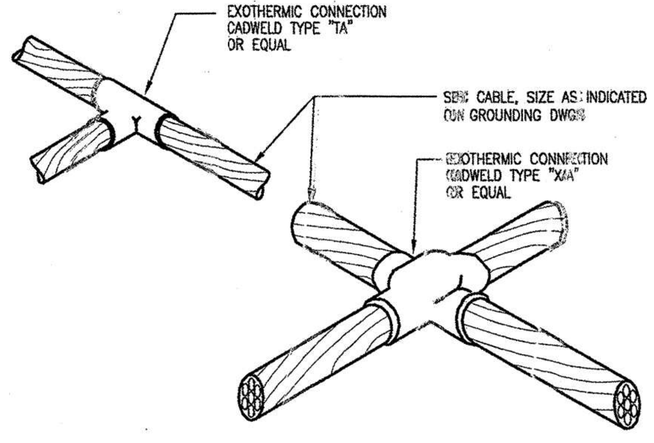
6 SPLICE CONNECTION DETAIL
1 1/2" = 1'-0"



1 CONCRETE REBAR GROUNDING
1 1/2" = 1'-0"



2 GROUND BAR ASSEMBLY
1 1/2" = 1'-0"



3 GROUND CABLE CONNECTION DETAIL
1 1/2" = 1'-0"

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REV. DATE. DRAWING APPROVALS

A/E DRAWING NUMBER
E0702

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51	52	53	WBS	REV
NC	NA		1.8.3.2	