

Dam Removal & Culvert Design Demystified

December 25, 2024 Burlington, VT



SLRCONSULTING.COM

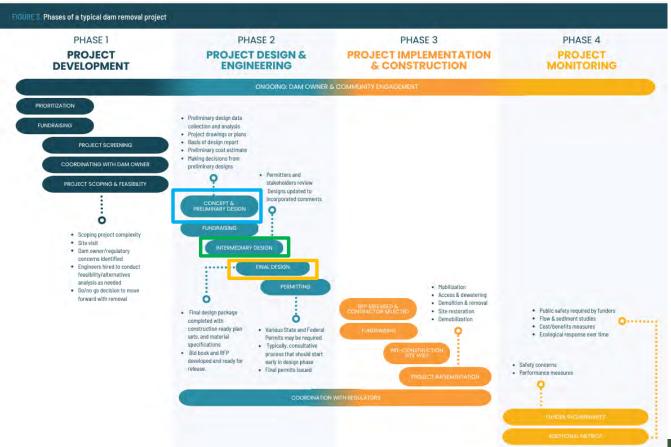
Design Steps – Clean Water Initiative Program (CWIP)

% Complete	Design Step	Description
60%	PRELIMINARY	Project partners, regulators, landowners, funders, public representatives, and consultants work together to identify and assess the <u>scientific and</u> <u>engineering challenges and conceptual</u> <u>approaches</u> . Data Collection, Conceptual (10%) Plans, Alternatives Analysis, Site Surveys and Mapping, Meetings, 30% Design Calculations and analyses on designs, Preliminary (30%) design report
100%	FINAL	BUILD PROJECT. 60/90/100% Design, Final (100%) Design Report.

(VTDEC, 2022)

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Design Steps – VT Project Guide by TNC



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Design Steps – WUV Grant Guidance

Project Type	Definition	Performance measure
Dam Removal – Preliminary Engineering Design	Preliminary design of a high priority dam removal project to restore hydrologic connectivity of surface waters. May involve alternatives analysis. Work must result in at least 30% design of project.	Number of preliminary (30%) designs completed
Dam Removal – Final Engineering Design	Final design of high priority dam removal project to restore hydrologic connectivity of surface waters. Work includes preparing permit application(s) and documentation of operation and maintenance plan(s).	Number of final (90%/100%) designs completed
Dam Removal – Implementation	Implementation of high priority dam removal project to restore hydrologic connectivity of surface waters. Permit(s), access license(s)/easement(s), and operation and maintenance plan(s) are in place prior to construction.	Acres of floodplain restored Linear feet of stream restored Stream miles reconnected for stream equilibrium/aquatic organism passage

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Design Steps - Demystified

% Complete	Design Step	Description
10% (0-20)	SKETCH	 INITIAL IDEAS. Project feasibility. Limited knowledge.
30% (20-40)	CONCEPT	 CONSTRAINTS, FOOTPRINT, INITIAL COST. Key constraints. Project footprint. Primary dimensions. Initial river profile. Ballpark cost. Seek landowner support.
60% (40-70)	PRELIMINARY	 REFINE DESIGN VISION AND COST. Lock in design path forward. Information for stakeholder understanding. Initial regulator review. Detail footprint, profile, section, and sediment management. Guide construction funding. Seek community support.
90% (70-95)	FINAL	 FINAL LANDOWNER AGREEMENT AND PERMITS. Access, construction details, sequence, final quantities, and refine cost.
100% (95-100)	CONSTRUCTION	BUILD PROJECT. Edits from regulatory process.

Design Step Selection

% Complete	Project	Description
90% Draft 100% Final	SIMPLE	 No constraints. No risk to property and infrastructure. Small river channel profile change anticipated. Long-term, breached, obsolete dam. Coarse sediment. Minimal permitting.
30% Concept 90% Draft 100% Final	MEDIUM	 Some constraints. Some potential short term instability influencing property or infrastructure requiring stabilization. Profile change expected. Larger dam with accumulated sediment. Moderate permitting.
30% Concept 60% Preliminary 90% Draft 100% Final	COMPLEX	 Major constraints. Channing instability potential for long term. Long-distance profile change possible. Large amount of accumulated sediment. Sensitive receiving waters. Complex permitting.

Sediment



- Volume (cubic yards)
- Toxics
- Nutrients
- Disposal
- Amount likely to move

Sediment

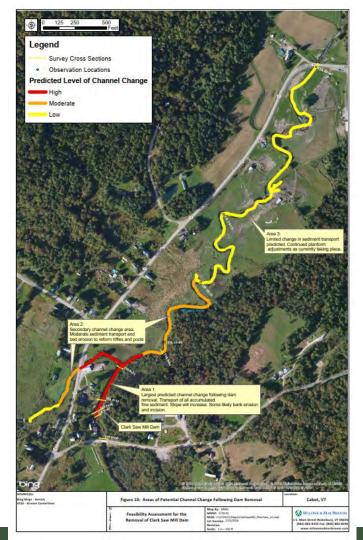




Figure 4: Breached Clark Saw Mill Dam (looking upstream on July 28, 2023)

Hydraulics

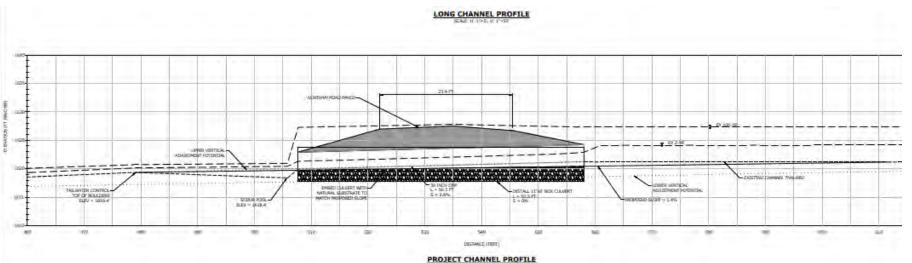


- Profile
- Channel change
- Validation for flooding and normal flows
- Aquatic organism passage
- Flood reductions
- New hydraulic controls

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Longitudinal Profile

Longitudinal Profile



KAL # D. T. T.

Alternatives Analysis – Dam Removal

1. None

- A. Safety risk
- B. Environmental risk

2. Partial removal

- A. Feasibility
- 3. Full removal
 - A. Benefits

Alternatives Analysis – Sediment Removal

- 1. None
 - A. Risk

2. Lower impoundment (limited)

- A. Approximately half of the sediment
- B. Would leave an over-steepened channel at bridge abutment to hold remaining sediment in place
- C. Risk of sedimentation and nutrient loading remains high

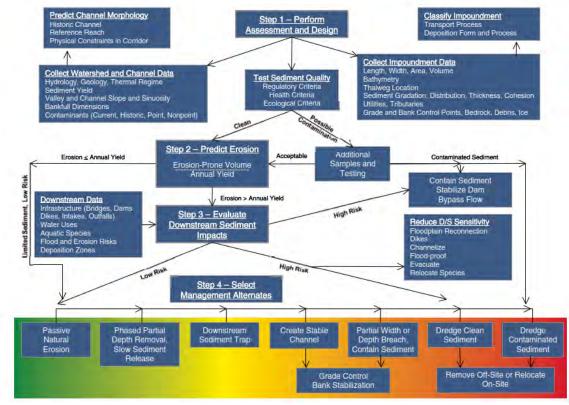
3. Lower and middle impoundment (half)

- A. Gets all the readily accessible sediment
- B. Slope transition more gently and natural
- C. Project limit is located at a more confined setting that is better to let adjust
- D. Easier to use large wood to hold grade and slowly release material at project limit

4. Lower, middle, and upper impoundment (all)

- A. Completely eliminate sediment and TP risk
- B. High per CY impacts for removal in upper impoundment
- C. Better to leave small amount and let it flow through system over next couple of larger floods

Alternatives Analysis - Sediment Removal



(MacBroom and Schiff, 2013)

Alternatives Analysis - Summary

	Alternative Description			Objectives			C	
ID	Dem	Sediment	Retaining Walls	Reduce flood and erosion risks to nearby property and infrastructure	Naturalize the river and floodplain to	Minimize future	Minimize construction costs	Notes
1	No removal (retain breached structure)	Na removal	No removal (retain existing)	NO	ND	NO	YES	onsafe existing conditions that could be dangerous to nearby property and impact water quality and habitat:
2	Full removal	No removal (allow for passive erosion)	No removal (retain existing)	yes	ha.	NQ	VES	Headcutting and excessive erosion would take place impacting water quality and habitat. Damaged retaining walls would likely fail soon.
3	Full removal	Partial removal (downstream of former bridge abutments)	No removal (retain existing)	YES	na.	ND		Sediment erosion will take place at the high-velocity area at the bridge abutments. Walls likely to fail.
4	Full removal	Partial (downstream of former bridge abutments)	Full (replace with slope)	YES	na	yes	VAC	Sediment erosion will take place at the high-velocity area at the bridge abutments.
5	Full removal	Partial (downstream of former bridge abutments)	Replace with new wall	YES	ng	YES		Sediment erosion will take place at the high-velocity area at the bridge abutments,
6	Full removal	Partial removal (downstream of wood jam at RS 8+36)	No removal (retain existing)	YES	Yes .	NO.	yes -	Good sediment removal option. Walls likely to fail.
7	Full removal	Partial removal (downstream of wood jam at RS 8+36)	Full (replace with slope)	YES	yes	YES		Preferred. Removes most of sediment and uses heavy stone slope with joint plantings in place of wall.
7	Full removel	Partial removal - only in channel upstream of abutments (downstream of wood jam at RS 8+36)	No removal (retain existing)	YES	yes	ND		Why not remove sediment on floodplain with invasives why in the area? Walls will fail.
	Full removal	Partial removal - only in channel upstream of abutments (downstream and upstream of former bridge abutments)	No removal (retain existing)	YES	hez.	ND		Why not remove sediment on floodplain with invasives why in the area? Walls will fail.
8	Full removal	Full removal (downstream and upstream of former bridge abutments)	No removal (retain existing)	YES	Yes	80	Leen.	Removal of sediment in upper channel seems like it will do more harm than good. No need for extra expense. Walls will fail.
10	Full removal	Full removal (downstream and upstream of former bridge abutments)	Full (replace with slope)	YES	YES	YES	10	Removal of sediment in upper channel seems like it will do more harm than good. No need for extra expense.
11	Full removal	Full removal (downstream and upstream of former bridge abutments)	Replace with new wall	YES	YES	YES	NO	Removal of sediment in upper channel seems like it will do more harm than good. No need for extra expense. Too expensive.

Connolly Pond Dam Removal - Shrewsbury

Photo-Documentation Connolly Pond Dam Removal Project, Shrewsbury, Vermont Location B, Looking Downstream





Connolly Pond Dam Removal - Shrewsbury

Photo-Documentation Connolly Pond Dam Removal Project, Shrewsbury, Vermont Location E, Looking Upstream





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Connolly Pond Dam Removal - Shrewsbury

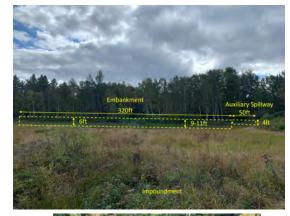
Photo-Documentation Connolly Pond Dam Removal Project, Shrewsbury, Vermont

Location G, Looking West





Concept Design



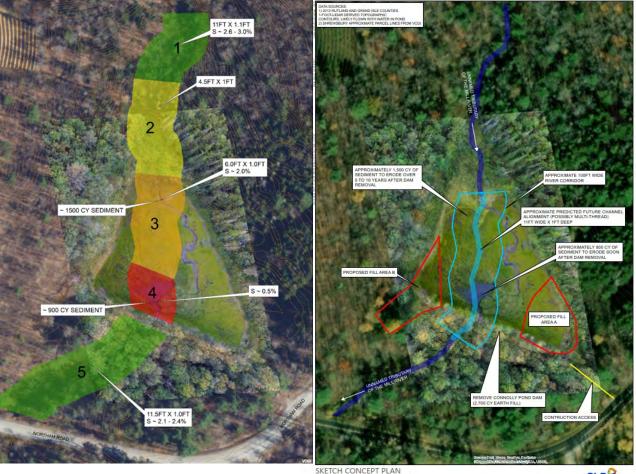


End of dry hydrant pipe (non-functioning) Rivulets through sediment

Accumulated sediment in former impoundment

(Marc Cimonetti, 2)

Concept Design

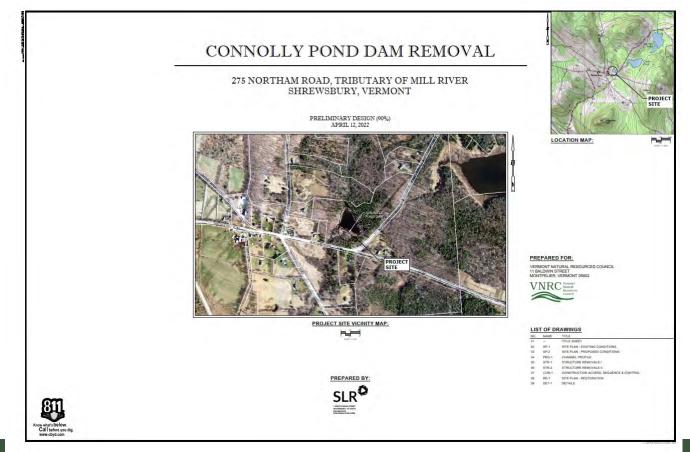


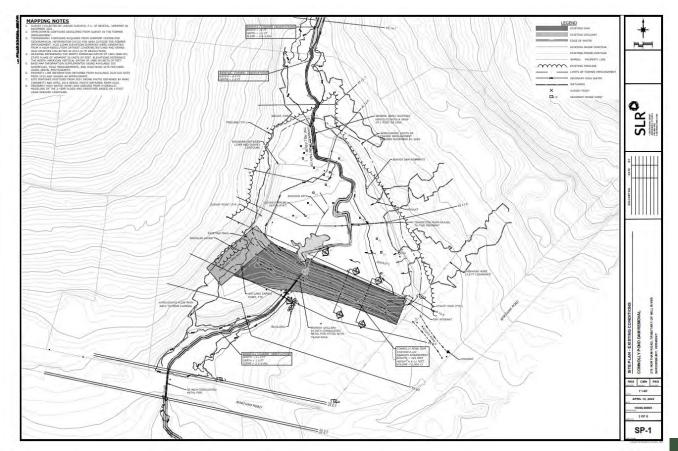
CONNOLLY POND DAM REMOVAL

VNRC

0 125 25 50 75 1 in = 70 feet







GENERAL NOTES

THE PURPOSE OF THIS PROJECT IS TO REMOVE CONNOLLY FOND DAM ON NORTHAM ROAD IN SHREWSRURY, VERMONT. THE LOCATION OF ALL EXISTING UTILITIES SHOULD BE CONFIRMED PRICE TO BEGINNING CONSTRUCTION: CALL "DOG SAME" AT 1-REP-DIG-SAME (344-7233). THE CONTRACTOR SHALL TAKE PROCAUTIONS NOT TO DISTURE RESISTING UTILITIES.

THE CONTRACTOR SHALL DESIGNATE A SUPERITENDENT AT THE START OF CONSTRUCTION AND THE CONTRACTOR'S SUPERITENDENT SHALL BE ON-STTE AT ALL THES DURING CONSTRUCTION. THE CONTRACTOR AND HIS/HER JOB SUPERITENDENT SHALL BE RESPONSIBLE FOR CONSTRUCT WITH THE JOB SPECIFICATIONS AND FERBITI REQUIRIESTING.

ALL STORAGE AND ACCESS ROUTES, PEDESTRIAN FINCES/BARRIERS, AND LIMITS OF CLEARING SHALL BE FLAGERD BY CONTRACTOR PEDER TO CONSTRUCTION AND APPROVED BY PROJECT ENGINEER.

WORKING HOURS SHALL BE APPEOVED BY PROJECT ENGINEER AND

NO CONSTRUCTION VEHICLES ENAL BE STORED, SERVICE, WACHED OR FLUSHED IN A LIDCATION WHERE LEAKS, SPILLARE, MACTI MACTIMAL, DE MATERIORIS, AN DEMONSTRUMENT ANALYSIS AND DE MATERIORISES, AN DEMONSTRUMENT MANAGEMENT FAN MALE MANTANED ON SITE AT ALL TIMES, IN THE EVENT OF AN ACCESSIVAL BULKER, MINERALITY STOR CONSTRUCTION WHERE MALE MANTANED ON SITE AT ALL TIMES, IN THE EVENT OF AN ACCESSIVAL BULKER, MINERALITY STORE CONSTRUCTION WHERE

CONTAIN THE SPOL, AND NOTIFY THE TOWN, APPROPRIATE AUTHORITIES AND PROJECT ENGINEER. THE SPILL RIT MUST CONTAIN AT A MINIPUM A CONTAINMENT BOOM, STRAM OR OTHER ABSORBENT MATERIALS, AND BUCKETS.

STORAGE AND OR USE OF CHEMICALS, FUELS, OLLS, GREASES, BITUIMNOUS MATERIALS, SOLIDS, WATE WASHINGS, AND CHEMIN SHALI BU HANDLE APPROPRIATLY AS TO PREVENT LEACHING OR SURFACE SUNDEF INTO WITLANDS, MATERCOURSES, OR DRAINS ALL APPROVID STORAGE FOR THESE MATERIALS MUST BE CONTINUE OF

EQUERMENT SHALL BE REPORTED FROM THE RIVER PRIOR TO REFLICUNG. NO REFUELING OF EQUERMENT ALLOWED IN THE WATER.

ALL EQUIPHENT AND VEHICLES SHALL BE CLEARED FRIDE TO AND FOLLOWING CONSTRUCTION TO REDUCE THE FOTENTIAL FOR SPREAD OF INVALUE DECIDE AND SECOND.

10. THE PROJECT SITE IS SUBJECT TO FLOODING. THE CONTRACTOR SHALL MONTOR WATNER FORCASTS AND STABILIZE THE CONSTRUCTOR SITE AND REMOVE EQUIPMENT FROM FLOOD PROME AREAS. ALL EQUIPMENT TO BE STORED ON HIGH GROUND.

11. WORK SHOULD BE PERFORMED DURING LOW WATER.

12. THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION DUE TO DELAYS IN WATER CONTROL ASSOCIATED WITH HIGH WATER LEVELS FROM

NATURAL EVENTS SUCH AS FLOGDS. THE CONTRACTOR SHALL MAINTAIN ALL ROADWAYS, SIDEMARKS, AND WALKWAYS IN THE AREA FIRE OF SOLL, PLO, AND CONSTRUCTION DEBROS. CONSTRUCTION ENTRANCES MUST BE MAINTAINED AT EACH SITE ACCESS FORT. SEE HUNG AND DITAILS.

14. CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS THROUGHOUT DURATION OF PROJECT.

AND OFSIGSED OF OR RECYCLED OFF SITE

PROPOSED LAYOUT, PROFILE, AND CROSS SECTIONS ARE TO BE STAKED BY THE CONTRACTOR AND REVIEWED BY THE PROJECT ENGINEER. FINAL DIMENSIONS WILL BE FINE-TUNED IN THE FIELD BY THE INDUSCT

REDROCK REMOVAL IS NOT PROPOSED, DO NOT REMOVE REDROCK WITHOUT DIRECTION OF PROJECT ENGINEER.

E. ANY MATERIAL EXPORTED OFF-SITE SHALL BE LEGALLY DISPOSED OF IN AN UPLAND LOCATION AT NO ADDITIONAL COST. THE ODMTRACTOR IS NSIBLE FOR FINEDING A SUITABLE RECIPIENT OF THE MATERIAL, IG REGULATORY APPROVAL FOR EXPORTED MATERIAL PLACEMENT

16. ALL AREAS SUBROUNDING THE PROJECT SITE DISTURBED EXERING CONSTRUCTION SIMULI BE RESTORED LIVON COMPLETION OF CONSTRUCTION, THE RESTORATION OF THE STEELS SUBJECT TO APPROVAL BY THE PROJECT ENGINEER AND LANDOWNER.

FOLLOWING COMPLETION OF CONSTRUCTION, THE CONTRACTOR SHALL PARTICIPATE IN A FRAME SITE INSPECTION WITH PRODUCT DISCIDLER FOR THE FUNDED OF VISITIVITY THAT THE PROSECT HAS BEEN CONFIDENT ACCORDINGS OF WE CONSTRUCTION PLANS AND THE TERMS AND CONSTRUMES OF THE CONSTRUCTION PLANS AND THE TERMS AND

OPERATION AND MAINTENANCE NOTES

DAM RENDVALS ARE INTENDED TO RESTORE STREAM DYNAMIC EQUILIBRIUM TO ALLOW THE STREAM TO MEANDER OVER THE. THE CHANNEL WILL MOVE IN THE

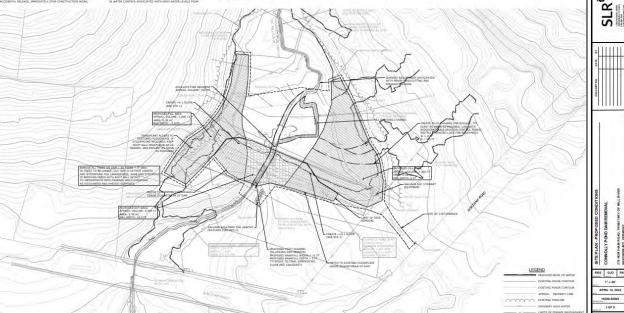
PLANTED VEGETATION IS TO BE NONITORED DURING THE GROWING SEASON FOR TWO YEARS TO DVALUATE A SUCCESSFUL VEGETATION ESTABLISHMENT OF BOW

3. ANY AREAS OF FOOR VEGETATIVE COVER SHALL BE REPLANTED ACCORDINGLY.

SEDIMENT MANAGEMENT NOTES

- EXISTING SEDIMENT VOLUME ACCUMULATED BENIND DAM = 4,050 CY OF INITION 900 CY ARE ESTIMATED TO MOBILIZE SLOWLY POST DAM REMOVAL EXPECTED HEDIANICAL REMOVAL VOLUME = +/- 200 CY OVER A CHANNEL LENETH OF 200 TEET. REMAINING SEDIMENT EXPECTED TO NATURALLY ERODE DOIMNETREAM O STABILIZE IN PLACE.

 PILOT CHANNEL DIMENSIONS WILL FOLLOW THE TYPICAL CROSS SECTION WITH CREATION OF A LOW FLOW CHANNEL AND LEAVING SECONENT TO FORM BARS MITHIN THE EXISTING CHANNEL. 1. STOCKFILE NATURAL STREAM GRAVEL, COBBLES, AND BOLLDERS TO REBUILD 4. STOCHFILE BOULDERS > L2* AND <> 45° AND LOGS OR STUMPS FOR RELISE AS DIAMAGE ROUGHNESS BLEMENTS WHEN RESTORING DAMARE MED. 5. TREES CLEARED OR LOGS INCOUNTIRED IN SECONDATION OF REPAILABLE IN CHANNEL OR FLOGDFLAD.

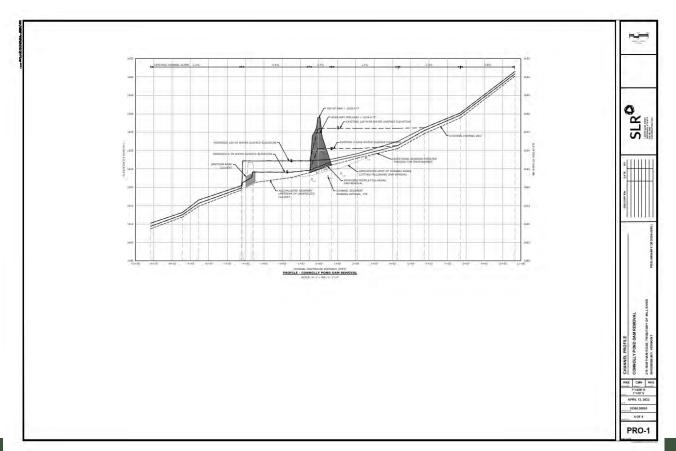


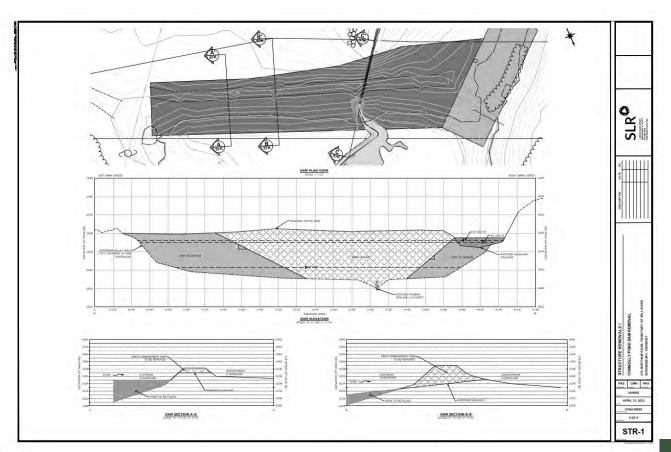


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TRAFFIC MANAGEMENT NOTES

- ALL TEMPORARY TRAFFIC CONTROL WORK SHALL CONFORM TO THE LATEST EDITION OF THE "MANUAL ON ENJFORM TRAFFIC CONTROL DEVECES" (MUTCH) AND ALL REVISIONS. ALL SIGN LEGENDS, BORDERS, AND MOUNTING SHALL BE IN ACCORDANCE WITH THE NUTCH.
- ALL CONSTRUCTION SIGNS SHALL BE IN FLACE PRIDE TO THE COMMENCEMENT OF WORK. ALL SIGNS SHALL BE INCUNTED ON THEIR OWN STANDARD SIGN SUPPORTS.

WATER CONTROL PLAN

- THE PROPOSED WATER CONTROL PLAN IS PROVIDED AS A RECOMPENDED APPROACH TO DEWATER THE AREA TO MINIMUZE THE RELEASE OF SECONDATES. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED WATER CONTROL PLAN TO THE PROJECT ENGINEER FOR APPROVAL PROR TO THE START OF CONSTRUCTION. BEGIN WORK DURING LOW WATER
- REPRAP FOLTER BERN SHALL BE INSTALLED PRIOR TO IN-CHANNEL WORK AND MAINTAINED THROUGH END OF
- INSTALL DEWATERING BASIN OR OTHER APPROVED DEWATERING DEVICE TO RECEIVE HET SEDDNENT IF NOT IMMEDIATELY REMOVED RIOM THE STIE. NO FERMANENT DISTURBANCE SHOULD TAKE FLACE DUE TO DEWATERING BASIN PLACEMENT.
- FLOW TO BE MAINTAINED IN A COMBINATION OF THE EXISTING AND PROPOSED CHANNELS DURING SEDDRENT IDAMS HAY BE USED TO DIRECT WATER AWAY FROM CHARENT WORK AREAS, ALL COFFERDAMS NEED TO BE
- REPOYED AT THE OF PROFESSION AND REPRAY FILTER BERN AND DOSPOSE OF COLLECTED SEDIMENT IN LEGAL AREA DUTSIDE OF FLOODPLAIN OR WITLAND AREAS.
- PLANDING IS NOT EXPECTED TO BE NEEDESCHY FOR THIS PRODUCT, SHOULD THE CONTINUED AT A DEMATTRING DESCHARGE PAREN OR OTHER DEVICE ANYONG THE MODIE'S ANYONG AT A DEMATTRING DESCHARGE PAREN OR OTHER DEVICE ANYONG AT A DEMATTRING DESCHARGE PAREN OR OTHER DEVICE ANYONG AT A DEMATTRING DESCHARGE PAREN OR OTHER DEVICE.

CONSTRUCTION SEQUENCE NOTES

POSED DAM REMOVAL SEQUENCE IS PROVIDED AS A RECOMM CED APPROACH. THE CONTRACTOR IS RESPONSIBLE FOR SUBMITTING A PROPOSED SEQUENCE TO THE PROJECT REGIMERS FOR APPOUND RECORD TO THE START OF CONSTRUCTION.

- SUBMIT A SCHEDULT, SEDMENT AND EROSIDE CONTROL PLAN, CONSTRUCTION SEQUENCE, AND WATER CONTROL PLAN TO THE PROJECT ENGINEER FOR REVIEW SEVEN (7) DAYS FRIDE TO INITIATION OF CONSTRUCTION. OBTAIN ANY RECEISARY WERE REMAITS AND SUBMIT SCHEDULES, FLAND, AND PRODUCT INFORMATION, INCLUDING THE DISERSENCY DEPENDION PLAN TO THE PROJECT ENGINEER FOR REVIEW SEVEN (7) DAYS PRIOR TO INITIATION OF CONSTRUCTION. CONTRACTOR SHALL PARTICIPATE IN A PRE-CONSTRUCTION SETS MALE WITH THE PROJECT DEGEMER AND OTHERS TO REVIEW ENVIRONMENTAL PERMIT REQUIREMENTS CONTRACT REOVERING, PROJECT LIMITS, AND CONSTRUCTION BETAILS.
- B STEP B: CONSTRUCTION SETUP ACTIVITIES
- INSTALL CONSTRUCTION WARRING SIGNS AND SAFETY FENCING. INITIATE TRAFFIC CONTROL AS MEDID. STAKE OUT LINETS OF WORK AND INSTALL SEEDMENT AND ERDSION CONTROLS, SAFETY FORCING, TEMPORARY CONSTRUCTION ACCESS, STAGING AND STORAGE AREAS, ALL TO BE REFURED BY PRODUCT INCIDENT. 2. WALT FOR LOW FLOW TO BEGIN IN-CHANNEL WORK
- C STEP C: STORE CHECK DAM AND TREE REMOVAL: INSTALL STORE CHIECK DAIN (SEE DET-L), OR APPROVED EQUAL, PRIOR TO CONSTRUCTION.
- HAINTAIN STORE CHECK DAM BURING CONSTRUCTION. REMOVE ACCUMULATED SEDIMENT REGULARLY, DWCE MADNINES CAN ACCESS AREA. A DEMONT TREES FROM DAM ENBANUMENT
- STEP D: DAM EMBANIMENT CUT AND FULL REMOVE DRY HYDRANT EQUIPMENT AND STOCKPLE FOR TOWN. EXCAVATE DAM EMBANKMENT AND USE MATERIAL TO FILL DESIGNATED AREAS. SEE SHEET STRIFFOR DAM ELEVATION.
- 3. ESTABLISH RIVULET CHANNELS THROUGH FILL AREA ON EAST SIDE OF RIVER. E STOP E CHANNEL RESTORATION AND SEDEMENT REMOVAL
- INCREMENTALLY LOWER DAM ALTERNATING WITH UPSTREAM SEDIMENT REMOVAL/CHANNEL RESTORATION. 2. REMOVE SEEMENT FROM LOWER IMPOUNDMENT. SPREAD REMOVED FINE SEDIMENT ON FELL SLOPES AS TOP SOIL. 2. ESTABLISH FILOT CHANNEL THROUGH LOWER IMPOUNDMENT.
- DETAIL REPORT TREES INTO ROLT BALLS AND BOULDERS IN PROPOSED PLOT CHANNEL AS SOON AS PROPOSED CHANNEL IS EXCAVATED. ETEP F: CHANNEL EXCAVATION THROUGH DAM
- COMPLETE DRANKEL EXCAVATION THROUGH DAN ERBANKMENT TO FINAL GRADE: RENOVE AND DESPOSE OF ALL OUTLET STRUCTURES. 2. REMOVE STORE CHECK DAM.
- G STEP G: POST-CONSTRUCTION ACTIVITIES: VERYORM SITE RECOVERY, REMOVE ALL ACCESS ROADS AND CONSTRUCTION INTRANCES, AND STABILIZE AND RESTORE ALL DISTURBED AREAS. COMPLETE SITE RESTORATION. RESTORE TO CORDINAL CONDITION, OR AS INDOCATED ON THE PLANS.

EROSION CONTROL NOTES

- THE SEDIMENT AND BROSION CONTROL FRACTICES INFLEMENTED AS PART OF THE PROJECT SHALL BE INFLEMENTED AND MAINTAINED ACCORDING TO THE LOW REAK STE HANDBOOK FOR EROSION INSTITUTION AND SEDIMENT CONTROL "QUIDANCE DOCUMENT FROM THE VEMONIT DEMATINATION WINDOWNETS, CONSERVATION, WHERA PAYLOARE IN CONSERVITATION WITH INSTOLET ENGINEER. A COPY OF THE APPLOVED EROSION AND SEDEMENT CONTROL FLAN SHALL BE HAINTAINED ON THE SETE AT ALL TIMES.
- 1. CLEARING OF NATIVE VEGETATION END CONSTRUCTION ACCESS SHOLLD BE NEW WITHD ALL SOR, DROGEN AND SECONDENT CONTROL PRACTICES GHALE BE WITHHERED. SOLL DISTURBANCE, OR IN THERE PROVED SECURISE, AND MAINTAINED UNTLI PERMANENT REDITECTION IN SETAMALISME.
- THE CONTINCTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL SOL REGION AND SEDIMENT CONTROL INDEGREES. THE CONTRACTOR WILL VERITY THE MAINTENANCE WEEKLY AND AFTER FAIN EVENTS AND REPORT IN WEITING TO PRODUCT DEGREER.
- THE PROJECT ENGINEER IS TO BE NOTIFIED IMMEDIATELY IF EXCESSIVE SEDIMENT EROSION TAKES
- PERFORM WORK DURING LOW FLOW FERIODS. IF A LARGE FLOOD IS PREDICTED, STOP WORK, STABILIZE THE SITE AND REMOVE EQUIPMENT FROM FLOOD PROME AREAS.
- STOCKOPIE AND STACING LOCATIONS AS INDUCATED ON THE PARKS AND AS APPROVED BY THE PRODUCT ENGEMENT, SHALL BE PARCED WITHIN THE LITEL TO POSTURIANCE, OWIELFANDS OUTSIDE ON THE PROJECT AREA SHALL BE PROTECTED AND REMAIN UNDESTURIED THROUGHOUT THE OURATION OF THE PROJECT.

INVASIVE SPECIES HANDLING NOTES

- THESE NOTES PROVIDE BEST MANAGEMENT PRACTICES FOR PREVENTING THE SPREAD OF INVASINE SPRCIES. ADDITIONAL INFORMATION ON NANDLING AND IDENTIFICATION OF INVASINE SPECIES CAN BE FOUND AT WWW VTINVASINES.ORG. 2. LOCATE AND USE STAGING AREAS THAT ARE FREE OF INVASIVE SPECIES TO AVOID SPREADING SEEDS AND OTHER VIABLE PLANT PARTS.
- FLAN WORK SEQUENCE SO CONSTRUCTION EQUIPMENT IS HOVED FROM AREAS NOT INFERTED BY INVASIVE SPECIES, MOVING INTO AREAS INVESTED WITH INVASIVE SPECIES WINNER FOR EMALLER. AND DEVELOPMENT, MACHINERY, AND MAND TODAY USED IN AREAS WHERE INVESTIG FLAMSTOR FLAMS SHOULD BE CLEANED OF ALL VISIBLE SOLI AND FLAM MATERIALS BEFORE LEAVING THE STEE ON MOVING TO AREAS NOT AREAST DIFESTED, CLEANING SHOULD DOCUM ATTIMUS THE AREA ALERANG THESTED, ACCEPTANCE CLEANING HETHORDS BILLION:

LEGEND

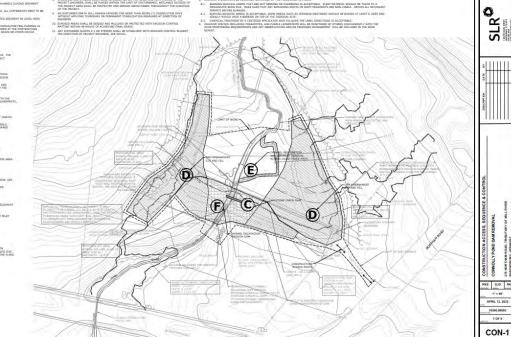
COCCOCCO EXISTING TREELING

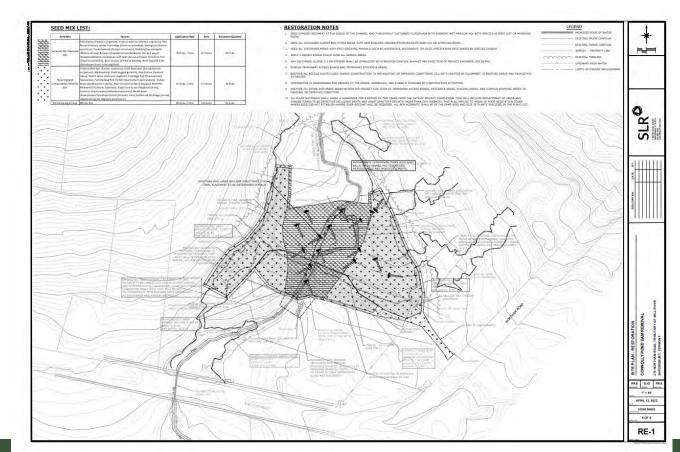
EXISTING MAJOR CONTOUR

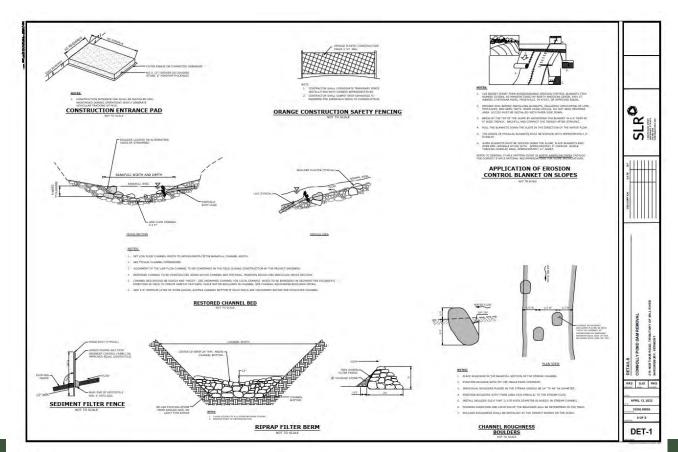
APPROX. PROPERTY LINE

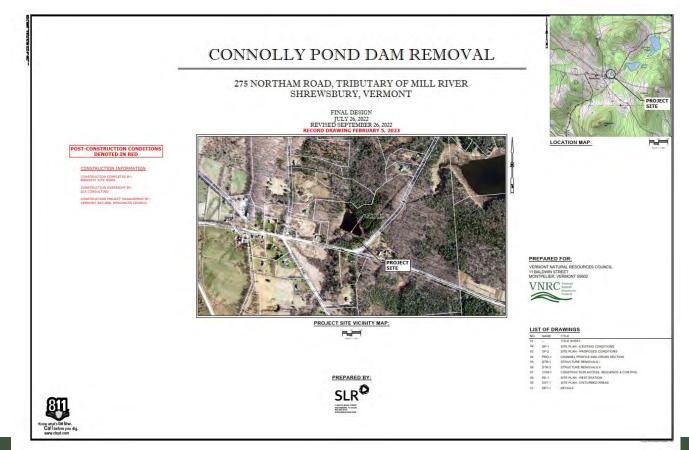
DRDINARY HIGH WATER - - LIMITS OF FORMER INFOUNDM

- PORTABLE WASH STATION THAT CONTAINS RUNOFF FROM WASHED EQUIPMENT HIGH RESOLUTE AT
- BRUSH, BROON, OR BAND TOOLS USED WITHOUT WATER
- 2. Indexts INCOMP. ON INSET FROM SITES THAT CONTAIN INVESTIVE PLANTS CANNOT BE USED AWAY FROM THE SITE OF INFESTIATION INTEL ALL VARUE PLANT WAITERAL IS REINDERED NONVALUE. EXCAVATED WATERIAL MAY BE REDUED WITHIN THE EXACT LINETS OF
- ANY EXTRA EXCAVATED MATERIAL CONTAINING INVASIVE PLANT MATERIAL MUST BE STOCKPILED ON AN IMPERVIOUS SURFACE U
- VIAGE PLANT MATERIAL IS DESTROYED ON DISPOSED OF BY BURYING 5 FEIT BELOW GROUND FOR FWRACHITES AND WHOTHED OR 3 FEIT FOR OTHER SPECIES. SOIL AND OTHER MATERIALS CONTAINING INVASIVE FLANT MATERIAL MUST BE COVERED DURING TRANSPORT.
- INVASIVE SPECIES CAN BE RENDERED NONVEABLE BY THE FOLLOWING METHODS.









GENERAL NOTES

THE PURPOSE OF THIS PROJECT IS TO REMOVE CONNOLLY POND DAM DRINORTHAM ROAD IN SHREWSBURY, VERNONT. THE LOCATION OF ALL EXISTING UTILITIES SHOULD ME CONFIRMED PRODE TO BEGINNING CONSTRUCTION. CALL "DEG SAFE" AT 1-BEB-DIG-SAFE

- (344-7213). THE CONTRACTOR SHALL TAKE PRECAUTIONS NOT TO DISTURB EXISTING UTILITIES.
- THE CONTRACTOR SHALL DESIGNATE A SUPERINTENDENT AT THE START OF CONSTRUCTION AND THE CONTRACTOR'S SUPERINTENDENT SHALL BE ON-STITE AT ALL THRES DURING CONSTRUCTION. THE CONTRACTOR AND HEAVER XOB SUPERINTENDENT SHALL BE RESPONSIBLE FOR CONVENTING HEITH THE SUB SERVICIDENTING AND FRENT THE REQUIREMENTS.
- ALL STORAGE AND ADCESS ROUTES, PEDESTRIAN PENCES/MARKERS, AND LIMITS OF CLEARING SHALL BE FLAGED IN CONTRACTOR PRIOR TO CONSTRUCTION AND APPROVED BY PROJECT UNGINEER.
- WORKING HOURS SHALL BE APPROVED BY PROJECT ENGINEER AND

DENOTED IN RED

- TION VEHICLES SHALL BE STORED, SERVICED, WASHED OR
- IN LOGISTICS OF DEVICES TRADE IN TRADE OF TRADE
- CONTAIN THE SHILL, AND NOTHEY THE TOWN, APPROPRIATE AUTHORITIES AND PROJECT ENGINEER. THE SPILL KIT MUST CONTAIN AT A NUMBER A CONTAINNERT BOOM, STRAIN OR OTHER ABSORDENT MATERIALS, AND ROCKETS.
- STORAGE AND DR USE OF CHEMICALS, FUELS, OLLS, GREASES, BITURINOUS HATERIALS, SOLIDS, WATER WASHING, AND COMENT SHALL DE INANDEA PREPARATELY AS TO PREVENT LANCING OR SUBFACE RUNOFF INTO WITLANDS, WATERCOULSES, OR DANNE, ALL APPROVED STORAGE FOR THESE MATERIALS, MUST BE CONTAINED.
- EQUIPMENT SHALL BE REMOVED FROM THE RIVER PEOR TO REFUELING. IN REFUELING OF EQUIPMENT ALLOWED IN THE WATER.
- ALL EQUIPMENT AND VEHICLES SHALL BE CLEANED FRICK TO AND FOLLOWING CONSTRUCTION TO REDUCE THE ADTENTIAL FOR SPREAD OF INVASIVE SPECIES AND SEDIMENT.
- ID: THE PROJECT STEE IS SUBJECT TO PLODDING. THE CONTRACTOR SHALL MONITOR WEATHER FORECASTS AND STABILIZE THE CONSTRUCTION SITE AND REMOVE EQUIPMENT FROM FUCCO FROME AREAS. ALL EQUIPMENT TO BE STORED ON HIGH RESIDENC.
- - 11. WORK SHOULD BE PERFORMED DURING LOW WATER. 12: THERE SHALL BE NO CLAIMS FOR EXTRA COMPENSATION DUE TO DELAYS IN WATER CONTROL ASSOCIATED WITH HIGH WATER LEVELS (ROM
- THE CONTRACTOR SHALL MAINTAIN ALL ROADWAYS, SIDEWALKS, AND WALKWAYS IN THE AREA FREE OF SOLL, MUD, AND CONSTRUCTION DEARLS. CONSTRUCTION ENTRANCES MUST BE MAINTAINED AT EACH

NATURAL EVENTS SUCH AS FLOODS.

- 14. CONTRACTOR MUST COMPLY WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL PERMITS THROUGHOUT DURATION OF PROJECT.
- ALL CONCRETE AND REINFORCING STEEL IS TO BE REMOVED FROM REVER AND DESPOSED OF OR RECYCLED OFF STEL 16. PROPOSED LAYOUT, PROFILE, AND CROSS SECTIONS ARE TO BE STAKED BY THE CONTRACTOR AND REVERVED BY THE PRODECT ENGINEER, FIDAL DIMENSIONS WILL BE FIDE-TURED IN THE FEELD BY THE PRODECT ENGINEER.
- BEDROCK REMOVAL IS NOT PROPOSED. DO NOT REMOVE BEDROCK WITHOUT DIRECTION OF PROJECT ENGINEER.
- ANY NATERIAL ENFORTED OFF-SITE SHALL BE LEGALLY DISPOSED OF AN UPLAND LOCATION AT NO ADDITIONAL COST. THE CONTRACTOR RESPONSIBLE FOR FINDING A SUITABLE RECIPIENT OF THE INATERIA
- GAINING REGULATORY APPROVAL FOR EXPORTED NATISFAL PLACEMENT IF MEDID, AND HAUSING.

4. ALL AREAS SUBROUNDING THE PROJECT SITE DISTUBBLE DURING CONSTRUCTION SPALL BE RESTORED UPON COMPLETION OF CONSTRUCTION. THE RESTORATION OF THE SITE IS SUBJECT TO ATYRODAL BY THE PROJECT ENGINEER AND LANCOUNDER.

FOLLDHEINS CONFLETION OF CONSTRUCTION, THE CONTRACTOR SMALL PARTICIPATE IN A FRAM. SITE INSPECTION WITH PROJECT INSIDER FOR THE PURPOSE OF VIEWTING THAT THE PROJECT HAS BEED COMPLETION ACCORDING TO THE CONSTRUCTION PLANS AND THE TERMS AND CONDITIONS OF THE CONSTRUCT.

OPERATION AND MAINTENANCE NOTES

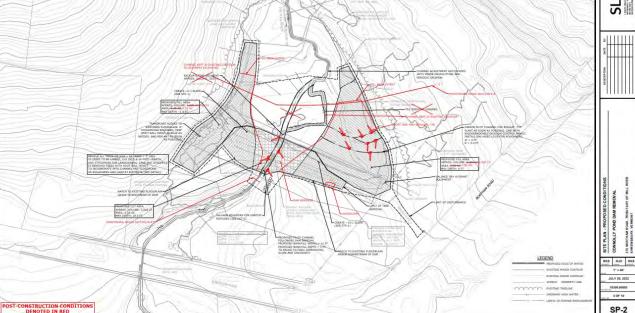
- DAN REMOVALS ARE INTENDED TO RESTORE STREAM DINAMIC EQUILIBRIUM TO ALLOW THE STREAM TO NEANDER OVER THE. THE CHANNEL WILL MOVE IN THE PUTURE.
- PLANTED VEGETATION IS TO BE MONITORED DURING THE GROWING SEASON FOR TWO VEARS TO DURLIATE A SUCCESSFUL VEGETATION ESTABLISHMENT OF BON-AREAL COVERAGE.
- 1. ANY AREAS OF POOR VEGETATIVE COVER SHALL BE REPLANTED ACCORDINGLY

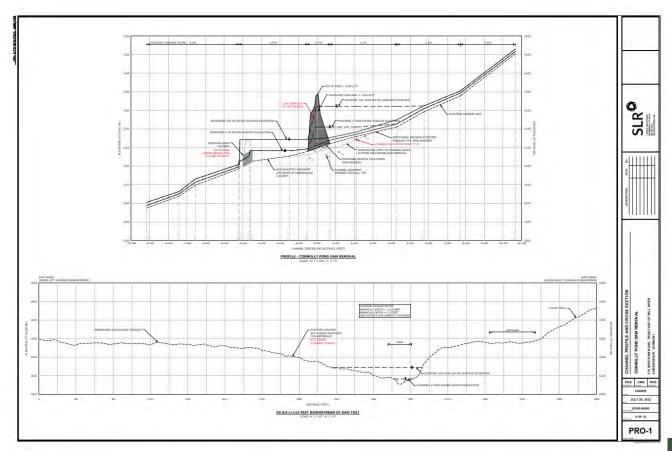
SEDIMENT MANAGEMENT NOTES

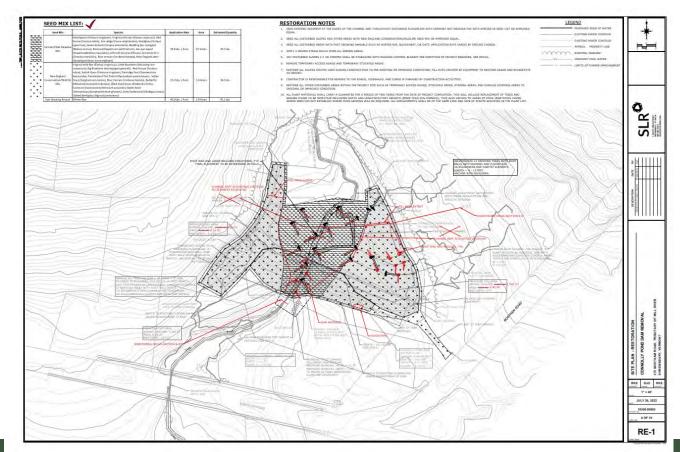
- EXISTING SEDEMENT VOLUME ACCUMULATED BENIND DAM = 4,000 CY OF WHEE 900 CY ARE SETIMATED TO MOBILIZE SEDANLY POST DAM KENDINAL EXPECTED WEEDMINGLA, REMOVAL VOLUME = w/-200 CY OVER A CHANNEL LINETIN OF 100 FEET. REMAINING SEDIMENT EXPECTED TO MATURALLY ENDER DOWNESTREAM DE STABLIZET DE MACE.
- PILOT CHANNEL DIMENSIONS WILL FOLLOW THE TYPICAL CROSS SECTION WITH CREATION OF A LOW FLOW CHANNEL AND LEAVING SECURENT TO FORM BARS
- 2. STOCKPILE NATURAL STREAM GRAVEL COBBLES, AND BOULDERS TO REBUILD
- 4. STOCKPLE BOULDERS > 12° AND <#8° AND LOGS OR STUNES FOR BUILDER AS ORANNEL ROUGHNESS ELEMENTS WHEN RESTORING ORANNEL BED.
- 5. TREES CLEARED OR LOSS ENCOUNTERED IN SEDENENT TO BE REINSTALLED IN CHANNEL OR FLOODELAIN.



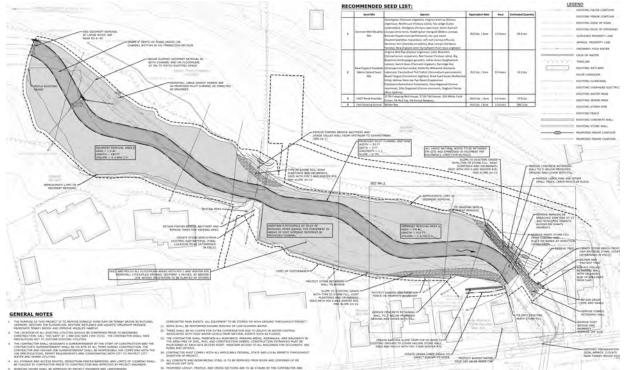
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Complex Design - Dunklee Pond Dam Removal

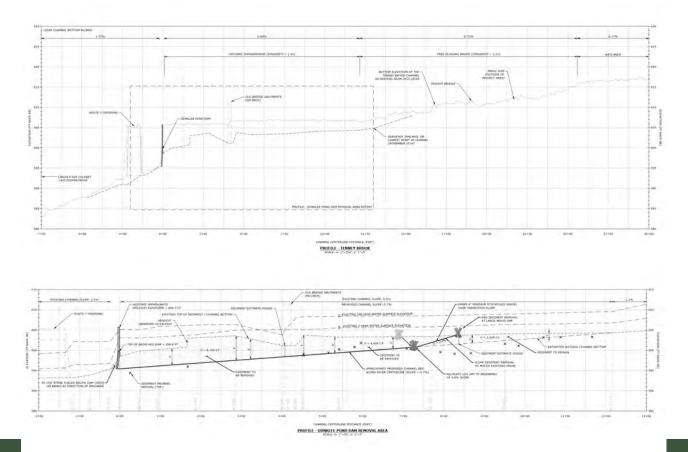


- Provinces Numes 1996; E. Martinoviji D.P. MOLICI, FOLMERI & Mal Lukopolineli.
 N. DO CONTENCINO NUMELIA, SINAL, S. TERRIS, INJECTIO, R. MARCINE, MARC
- HOUSE ENCODER, THE DESL, KET HUST COMMEND AT A FEDERUM A COMPARINENT HOUR, STAAK OR OTHER A BOOMT HUSTAND, AND BOOMTS. 1. STOMATA AND OR LUIS OF CHEMICALS, THEIR, CIRS, CHEMICS, STHERIDUS HATTERIALS, SUILDS, WASTE MANUFOR, AND CHEMIC DIGULAL ENVIRONMENTAL ART TO TRUNKIT LANCENS ON SAMPLER MANUFOL, AND CHEMIC DIGULAL ENVIRONMENTAL ART TO TRUNKIT LANCENS ON SAMPLER MANUFOLISMO, AND CHEMICAL INFERENCESS. OR DRAMS, BL, APPROVED STORAGE FOR THESE PM/STRUKE AND TE CONTINUED.
- Mathematics Heart BE Contracted Hourt THE BRIDE INS BEFORE AN INTERLINE OF EQUIPMENT ALLOWED IN THE WARKS.
 - ALL EQUIPHENT AND VEHICLES SHALL BE CLEANED PRICH TO AND FOLLOWING CONSTRUCTION TO REDUCE THE POTENTIAL FOR SAMEAD OF INVESTIG SPECIES AND SEDIMENT.
 - 15 THE PROJECT SITE IS SUBJECT TO FLOODING. THE CONTRACTOR SHALL MONITOR REFINER PORECASTS AND STABLESS THE CONSTRUCTION SITE AND REMOVE POLIFIENT HERM FLOOD HOURE ABLES DORING
- INCREDIBLE LAYOUT, PROFILE, AND CROSS SECTIONS ARE TO BE STARED IN THE CONTRACTOR AND RESIDED BY THE PROJECT ENGINEER, ITSAL DEPENSIONS WILL BE FINE TUNE TO BE TRUE TO THE PROCESSION DEED.
- BERKET MINISTER,
 BERKET MINISTER, DI NOT PROPOSED, DO NUT ASINOVE REDROCK WITHOUT DIRECTION OF PROJECT TRADIECTA.
 BERKETAN, DI REPROPINED BY PREDAVICAL PRANS UNLY - BLASTING AND INTRAALIC ORDIGANS IN DISCUSSION TO BE PREVAMEND BY PREDAVICAL PRANS UNLY - BLASTING AND INTRAALIC ORDIGANS
- NO 18. EXCANNING YO BE PREVAMED BY RELIANCEAL PERSO UNLT. BLANKING AND PROVALING WE ARE NOT REPORTED, DO NOT REPORT COARSE BATURAL BED ARRON LARGE. DO NOT OUER EX PRODUCT ENCOMES TO BALVEW PROPOSED CAROLS WITH COMPACING AS AN UNIX PRODUCTS.
- 15. ARY MATERIAL EXPORTED DRIVESTIE SHALL BE LEGALLY DESPOSED OF the AR OPLAND LOCATION AT NO ADDITIONAL CORT. THE CONTRACTOR IS ADDIVESTIES FOR FUNCTION & SUCTIAL RECORDER OF THE MATERIAL, GLARDER SEQUELATION APPROVAL FOR EXPONENT INSTALLY RECORDERS.
- RLL ANKING SUMMOUNDERLITHE INCOMET SITE DISTUMEND DURING CONSTITUCTION SHALL BE RESTORE UPON COMPLETION OF CONSTRUCTION. THE RESIDIATION OF THE SITE IS BURGET IND ARMONG. BY THE INCOMET INCOMENT. AND LIADOWINES.
- Inclusion comercial constraints of the contraction shall, had regardless that the selectronic constraints of the constraints from the ventore of ventores that the endotron was were constraints according to the constraints from the ventore of ventores that the endotron was were constraints and all local, states, were tobastal, ensembles.

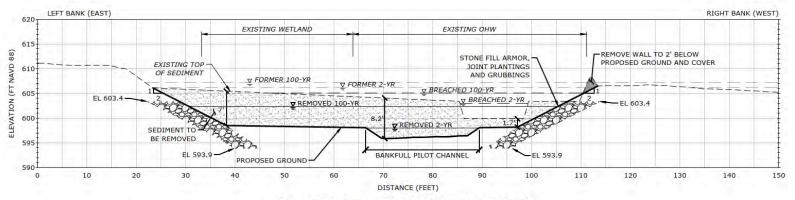
SITE RECOVERY NOTES

- BUD DUROSED SECRETATION THE EXCESS OF THE DUROSED, AND THREEDOWN THEM INCOMPARE WITH VERNOT WITH PRACEW HIS WITH SECRETS IN SEED US? OF APPROVED EXOME. WITH DERIVIED SLOPES WITH NEW ENGLINE RODOLESE MATERY UPLAND SEED HID, OR APPROVED DURO.
- APPROVED EQUAL: 5. SEED ALL DEFUNISED LAWA AND PATH AREAS WITH VACH RURAL AREA HDV, OR APPROVED EXXIV.
- 4. SEED ALL DESTURBED AREAS WITH WINTER BIS, OR APPROVED EQUAL 5. APPLY 2 DICHES LTRAW HILDLI OVER ALL SEEDED AREAS.
- ANY GETURIED SLOPE 2.1 OR STEPRE SHALL BE STARLED WITH ROSIDA CONTROL BLANKET FRE DIRECTION OF PROJECT INCIDER, SEE NETAL.
- DO NOT ANY VIENTILIZER OF LINE WITHIN 25" OF FLOWING WATER.
- NEMOUS TOMONARY ACCESS INJUST AND TEMPORARY STOCKED AREAS
 RESTORE ALL ACCESS NOUTES LIKED DURING CONSTRUCTION TO HER EXISTING OR DWNOV CONSTRUES, FILL NUTS CREATED BY EQUIPMENT. TO RESTORE GRADE AND REVISITIATE A RESTORM.
- ICONTRACTOR IS RESPONSIBLE FOR REPAIRS TO THE ROADS, HARVING ARRAS, SEDEWALKS, AND CURRS IF GAMAGED BY CONSTRUCTION ACTIVITIES. INSTRUME ALL OTHER DISTUBLES ARRAS WITHIN THE REPORT SITE DUCK AS TEMPORARY
- HESTORE ALL OTHER DISTLARED AREAS WITHOUTHE PROJECT SITE SUCH AS TENNORARY ACCESS REACS, STOCKILL AREAS, STACDIC AREAS, AND SURFLUS DESIDEAL AREAS TO ORIGINAL OF IMPROVID CONSTITUE.
- 12. ALL REAMT HATERIALS SHALL CARES AN ION SURVINI, SATE COMMOTEE FOR A RESOLUTION TWO SEARS FROM THE DATE OF MODEC COMPLETION. THE AMPLIES TO AREAS OF YOR VEDERATION COME WHERE SEED ON YOT STANLISH WHILE OVER OFENSIVE MEDIATION COME WHERE SEED ON YOT STANLISH WHERE WITH DATES SPECIFIED IN THE MANUTER.

Complex Design – Longitudinal Profile



Complex Design – Stablize Section



RS 0+51 (51 FEET UPSTREAM OF DAM)

Design Demystified



Design Demystified



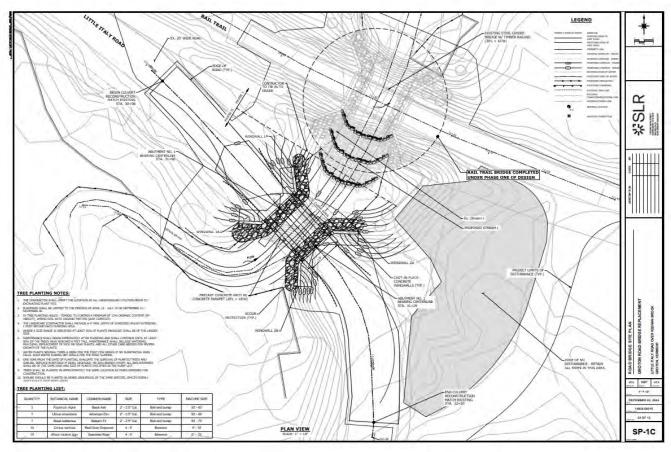
UIEW LOOKING EAST

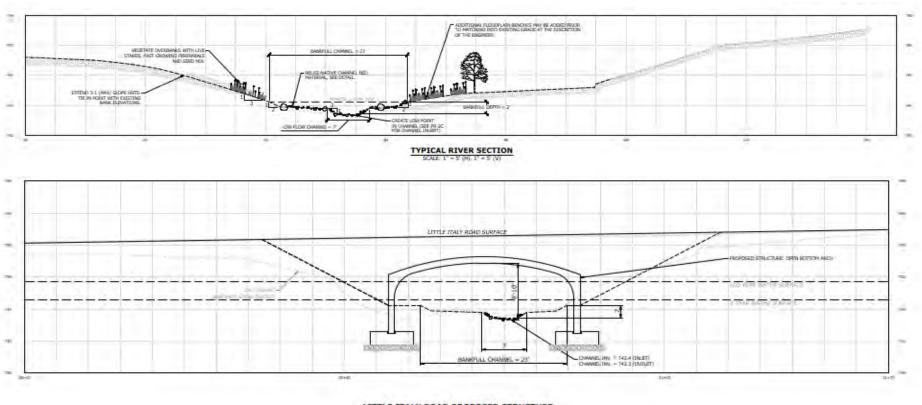


One Year Post-construction

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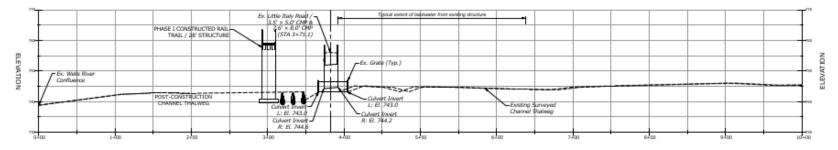
LITTLE ITALY ROAD PROPOSED STRUCTURE SCALE: 1" = S' (H), 1" = S' (V) 쑸

KEENAN BROOK PROPOSED CHANNEL PROFILE

SCALE: 1" = 20' (H), 1" = 5' (V)



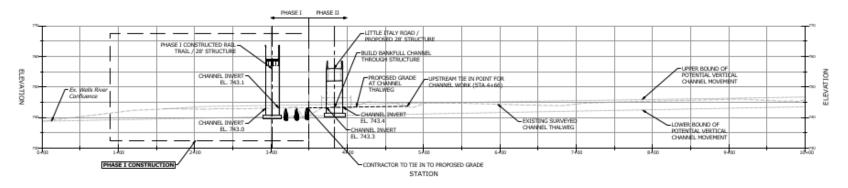
Final Design (100%)

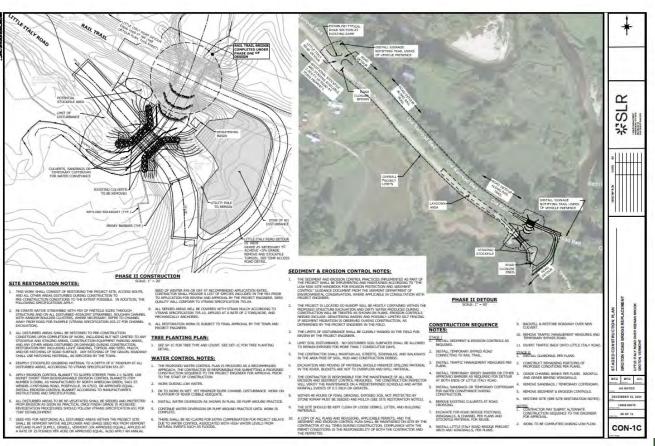


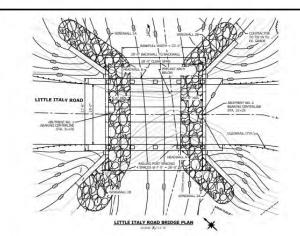
STATION

KEENAN BROOK EXISTING CHANNEL PROFILE

SCALE: 1" = 20' (H), 1" = 5' (V)







GENERAL NOTES

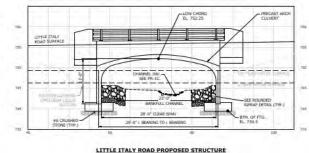
- THE RAVE REQUER A CONTINUCTOR'S WORKING KNONLEDG OF LCCA, MARCENI, AND STATE CODES FOR UTLIT'S STREME, ANY CONFLICTS ENVERTING MARCINGS AND LCCATORING SHOW, AND LCCAL REQUEREMENTS SHALL BE BOARD TO THE ATTENTION OF THE ENABLER PRIOR TO THE EXECUTION OF WORK. THE ENABLEMENT WILL NOT BE HEAD LLABLE FOR COSTS INCLAIMEDT OF WILE HEAD OF COMERCE WORK WHICH DOES NOT COMPARE TO LCCA. CODE.
- ALL FUEL, OLL, FAINT, OR OTHER HAZARDOLS HATERICALS SHOULD BE STORED IN A SECONDARY CONTAINER AND REMOVED TO A LOCKED INDOOR AREA WITH AN IMPERVICUE FLOOR DURING NON-WORK HOURS.
- 3. ALL PROPOSED CONTOURS AND SPOT ELEVATIONS INDICATE FINISHED GRADE.

STRUCTURAL NOTES

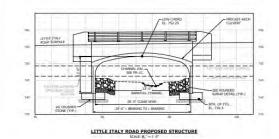
- 1. SPECIFICATIONS: VERMONT STATE DEPARTMENT OF TRANSPORTATION SPECIFICATIONS, CATED 2024.
- DESION SPECIFICATIONS: STANDARD SPECIFICATIONS FOR HIGHNAY BIDDLES (AMSHTO LAPID, WH EDITION, 2020) WITH INTEREM SPECIFICATIONS OF TO AND INCLUDING 2016, AS SUPERIMETED BY THE VEHINDAT STATE DEPARTMENT OF TWANDORTATION BIDDDD EDISON MANALL.
- ALLOWARLE DESIGN STRESSES. LLASS "HP" Ft = 4,000 FSI (CONTRACTOR TO SUBNIT MIX DESIGN FOR APPROVAL)
- 4. REINFORCEMENT: ASTM A615 GRADE 60 IV = 50,080 PSI
- 5. LIVE LOAD: HL-93
- 6. COMENSIONS: WHEN DECIMAL DIMENSIONS ARE GIVEN TO LESS THAN THREE DECIMAL PLACES. THE OWITTED DUGITS SHALL BE ASSUMED TO BE ZEROS.
- 2. Distinui consisting consisting of the destinuis structure service on these taxes and not consist, interaction on the destination of the dest

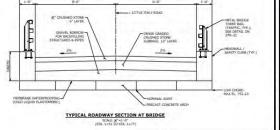
CONCRETE NOTES

- 1. REMAIN-IN-PLACE FORMS: THE USE OF REMAIN-IN-PLACE FORMS ON THIS STRUCTURE IS NOT ALLOWED.
- 2. CLASS "HP" CONCRETE: CLASS "HP" CONCRETE SHALL BE USED FOR THE BRIDGE ABUTMENTS.
- 3. CONCRETE COVER: ALL REINFORCEMENT SHALL HAVE TWO INCHES OF COVER UNLESS DIMENSIONED OTHERWISE.
- 4. EXPOSED EDGES: EXPOSED EDGES OF CONCRETE SHALL BE BEVELED 1"x1" LINLESS DIMENSIONED OTHERWISE.
- 5. REINFORCEMENT: ALL REINFORCEMENT SHALL BE ASTM A615 GRADE 60.
- 5. EPOXY COATED REINFORCING BARS: ALL REINFORCEMENT WITHIN THE ABUITMENTS SHALL BE EPOXY COATED AND SHALL BE INCLUDED IN THE INFTITEM.
- 7. CONCRETE DISPOSAL: CONCRETE IS NOT TO BE DISPOSED ON STIE.



SCALE 2." = 1'-0"



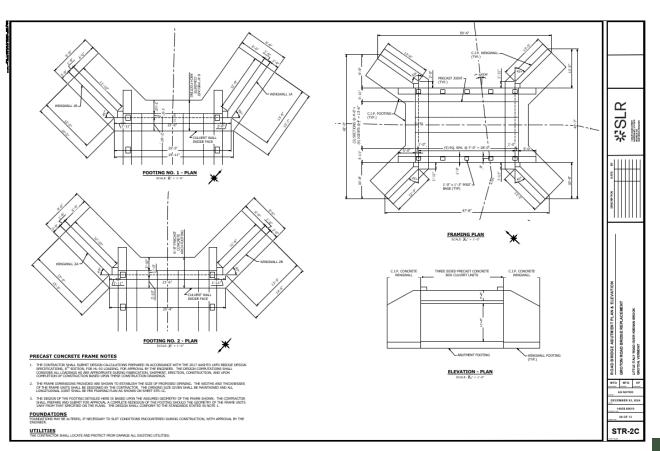


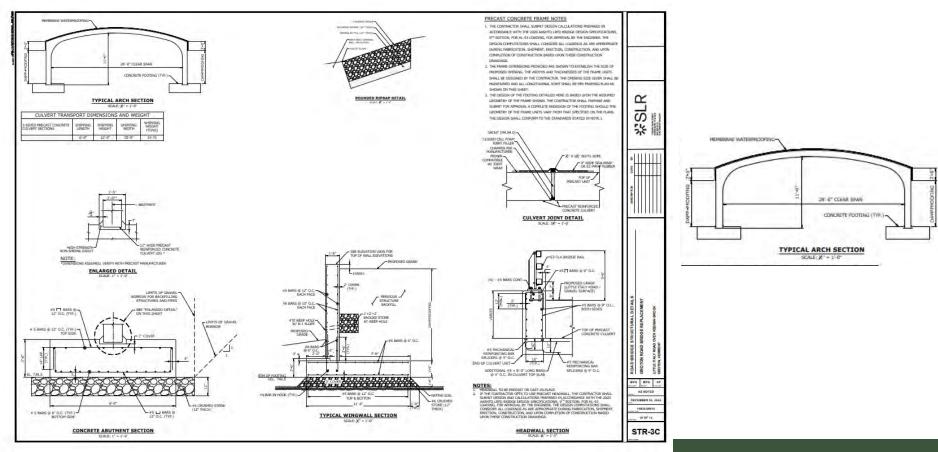


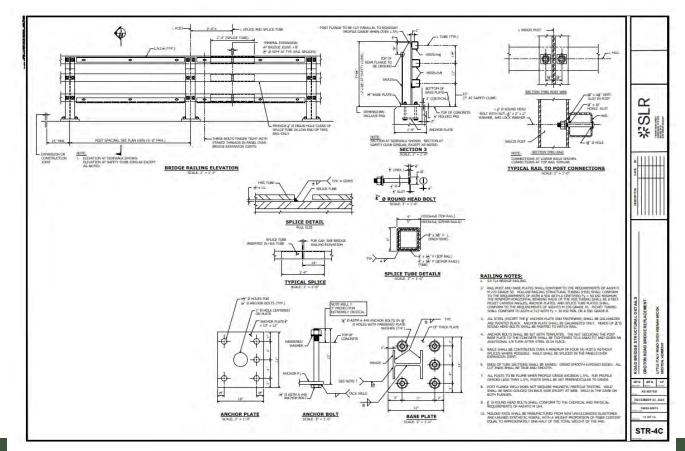
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Final Design (100%)

13 BANOULL CHAINS CHANNEL BED GRADING AND RESTORATION NOTES: SEDIMENT & EROSION CONTROL PERMANENT VEGETATIVE COVER BACKFILL SPECS: EX. DRADE SPECIFICATIONS REMOVAL OF EXISTING BED ARNORING: GRANULAR BACKFELL FOR STRUCTURES: GRANULAR BACKFELL FOR STRUCTURES SHALL BE OBTAINED FROM APPROVED an application residue point, on provincipant of the pro-HANDEL . 1.1 REMOVE AND STOCKPILE ALL EXISTING SAND, GRAVEL, COBBLE, MID ALC: NEC SDURCES, IT SHALL CONSIST OF SATISFACTORLY GRADED, REE DRAINING GRANILAR MATERIAL REASONABLY FREE BOULDER TO MINIMUM 12" DEPTH WITHIN EXISTING BANKFULL CHANNEL, REUSE MATERIAL ON TOP 18" OF FINAL CHANNEL BED ALL BOULDERS OVER 3" IN SIZE LOCATED PARTIALLY OR FULLY CONTRACTOR DESCRIPTION AND THE OWNER OF A DESCRIPTION OF THE OWNER OF THE OWNER OF THE OWNER O FROM LOAM, SILT, CLAY, AND ORGANIC MATERIAL. 2' BANKFULL DEF WITHIN THE 15" SHALL BE REMOVED FOR REUSE FOR FINAL BED COMPACT ALL BACKFELL AROUND FIRE IN 6" LIPTS TO ARM BING r. Partal Monthli Monthli Matter operation weaking and MEMBER 195% AASHTO 199 STANDARD PROCTOR DENSITY. ASSURE VOIDS AND SOFT SPOTS DO NOT DOTUR UNDER THE 2. CHANNEL FORMATION: personal coming many, hi one were entry sources many order search LAND GRADING . However, all planting domains statuted in the constant of the Market Statute of the Ma ASSURE VOLDS AND SCH1 SHOTS DO NOT DECLIR UNDER THE HAUNCHES, BACKFILL HEIGHTS MUST NOT HAVE MORE THAN A TWO LIFT DIFFERENTIAL FROM ONE SIDE OF THE FUE TO THE OTHER TO PREVENT DISTORTION DURING COMPACTION. 2.1. PERFORM ROLCH GRADING OF CHANNEL DO NOT RELISE PINE-GRAINED SUITS, CLAYS, OR DRGANIC INVERTIGAL WITHIN THE INVERTICE OF ADDRESS. THE MENANTICS OF THE ENGLISH END STATES IN INCOMEDIATE AND THE HIS OPERANTICS OF ACTING IN INSTANCE AND ADDRESS OF ALL MECTING AND COMMAND ATTAINED AND ADDRESS OF ADDRESS. TYPICAL CROSS SECTION BANKFUL CHANNEL. TO ESTABLISH NEW CHANNEL IN FILL SITUATION: FILL TO WITHIN LSP OF FINAL GRADE WITH NATURAL SAMD & 2.2 a reclassioner of fact or lasts in section tests of the primes was reconciliants, to be period, 0, 15 - Contract and a second s GRANULAR BACKFELL FOR STRUCTURES (VIRANS 204.30) HANNEL BED CONSTRUCTION AND MATERIALS TO CONFORM Lind mechanism hypothesis faces on binness tails area. Port an information of the production for data value call of the CRAVE COBLETED LEER IS USED FROM ON SITE EXCAVATION I NOT USE SUITS, CLAYS, OR ORGANICS. BO NOT USE STOCKPETED SHALL MEET THE GRADATION REQUIREMENTS OF THE POLLOWING TABLE AS DETERMINED IN ACCORDANCE WITH VEGETATIVE COVER SELECTION NORMAL WISE TO NOTES, ON THIS SHEE CARLENANCE OF BOLY MAXIMUM DAVA NOT BE PERIOD THAT BED ARMORING AS GENERAL FILL TO RAISE BED. PLACE FINAL 18" OF & MULCHING AASHTO T27 AND AASHTO T11 R MATERIAL FROM STOCKPILED MATERIAL, AND SUPPLEMENT WITH BED A NEW WAY SHOULD BE MADE TO DOMOLT SAMPLE WE BE AND IN TOKE BEAMS OF CONTRACT SAMPLE A AND THESE SAMPLES OF WAR AND TAX TAX PARTY. ARMORING AS DESCRIBED BELOW. TO ESTABLISH NEW CHANNEL IN CUT SITUATION. IN SUITABLE SOL 23 HEALTH THERE IN A REPORT OF THE PARTY OF THE TO ESTABLISH NEW CHANNE, IN CIT'STUMUTON, IN SUFTABLE SCIE JACK FINAL FE OF MATERIA, RAND STROATED ANTERIAL, AND SUPERFIELD WITH RECARACING AS DESCRIPTO RECOM-DUCTION OF AND ADDRESS AND ADDRESS AND ADDRESS AND SUPERFIELD AND ADDRESS AND ADDRESS AND ADDRESS AND SUCCESSION AND ADDRESS AND ADDRESS AND ADDRESS AND SUCCESSION AND ADDRESS AND ADDRESS AND ADDRESS AND SUCCESSION AND ADDRESS AND TABLE 704.08A Inconstruint, Section with the Heat for Const To Respective Lines-ter inconstant within their inconstruint, which is the section of the section of the section of the section of the respective Heat Inconstruint, Building, UPT-LINE, OR CONSTRUCTION, Section of the (STREET, STREET, STREE S 2.4. CAR TAL MOLT IN TACK SHOWS IT ALL SITE (FIGURE A mention of all the Departure of the All Site (Figure a All scourses, or petite resits, assess 쏬 SIEVE DESIGNATION ING SQUARE HESH SIEVE MAX: 3:1 SLOPE -23" BANKRUL CHANNEL DESCRIBED BELOW: TO THE IN W/ 75 mm (3 inch) P-OF LOW The Set states of the TIRICAL HIDPLE VIEW EX. GRADE TOPSOILING I CHANNEL ROW 3.1 LOW FLOW CHANNEL SHALL BE A TRAPEZOIDAL CHANNEL WITH V-SHARED CHANNEL BOTTOM WITH APPROX. 10% SLOPE FROM DEEPEST FOORT TO BANKS. HANNEL 150 µm. (fla. 100) RESTORED CHANNEL BED I TA COORDED DRAFTING WHILE IN DRAFT OVER ALL INVESTIGATION OF A STATE RECEIPTING OF INTERACTION OF A STATE REPORT RECEIPTING OF ALL OF WHICH TO A Invested Annual and a state of the restored on order and a rest descent of the PT Sections (Provide Transformers). THALWEG -Machine Control of the history of the protect shared so the second solution of the second solution of the solu . UP IN ATTRACT THE OWNERS IN SHARE TO PROVE A LODE 4. BANK ISTING GRACE 1/2" COMPACTED BROKEN STONE 5, THEY ALLING STORE AN LINE AND TRADUCTION T, ARL BELLINGTHE ACCOUNTS TO ARE REPORT. IN MEDICATING, DELLING, OF STREAM, CONTENTION, PROF POST LIVERAN A 2-1 BANK SLOPE SHALL BE AT EDGE OF DOW FLOW AND BANKFULL SLOH - LOC MENTS 42 BANKFULL DEPTH COURT MAND AND LINEAR MEET AND NEED TANK IN THE TWO THINKS IN MEET MULTING SEAL WARK INCOME REAL PRODUCTIONS. C FROMEN HELT STOP MENT CONTROL PARAGE OF DARSD PQUAL (DEDFENTILE DARSD PQUAL (DEDFENTILE CHANNEL A 3.1 MAX. SLOPE SHALL BE ON RUDODRUAINS. EXTEND TO THE IN TOTEL INCLUSION PATERAL CONTENT OF TRUDECK. INVESTIGATION PROVIDENT TO THE CALENDARY OF PLANTS. NON-MOVEN GEOTEXTILE PARKS 4.2 12048 MIN. TEMBLE STRENTS POINT WITH EXISTING GRADE. DIFFERENT SLOPES MAY BE USED WITH APPROVAL OF ENGINEER. promision of the second s T. THINK BELLO MANY & AMERICAN LINESTING. Listal seculation internet all passes in the All Harry Internet action of All All All All Provide the South State (Str.). COMPACTED SLE GRADE 5. BED MATERIAL GRADATION: A 19 YO REPORT OF LOT OF THE REPORT OF THE PARTY OF THE PARTY. - VE SUP WHET TABLE & ATTACK CONDUCTION OF WITH BALLS NOTES-5.1 SUBSTRATE USED TO FORM THE BED OF THE CHANNEL SHALL NATCH THE CHANNEL CLOBE TO THE CONFLIENCE OF THE WELLS INVER, WHICH ALSO MATCHES SUBSTRATE IN THE UPSTREAM FORESTED AND 1. THE POP BODS AND STORE FOR INSIDE 1, AND A DESIGN ADDRESS TO AND ADDRESS. IRDADE STORE TO BE REPORT UPON COMPLETION OF CONSTRUCTION, AND OBSILATED WITH TOPSCH, OPENHALD AND/A TO BE STORED AND INACTION ACCOUNTS THE DRI RESOLUTION RANK. EROSION CHECKS THE SUBSTRATE SHOULD APPROXIMATELY MATCH DRADATION SHOW - RURY BID OF GEOTERINE CLARGED TOPICS, LIKEDOM, VID & DIFFE CARE LIKET - DODORDAY IN THE TABLE, TO BE APPROVED ONSITE BY THE PROJECT ENGINEER. SUBSTRATE RECOMMENDATION TYPICAL CROSS SECTION TEMPORARY SUBSTRATE PERCENT (%) SEDIMENT FILTER FENCE TEMPORARY VEGETATIVE COVER CONSTRUCTION ACCESS ROAD 100 DOULDER COBBLE DHANNEL/BED CONSTRUCTION -85-70 AND MATERIALS TO CONFORM IS, BALES INFOLING BE FOR THE A STORE WITH AND A TODAY AND AND THE ... NORMAL TO NOTES, ON THIS SHEET A ARCH BALE MALL OF DESIGNED AND THE THE TOP AND A THE ARCHITECTURE (CT) plant today at large and a second to waits to which today and attended with the plants to the plant of the dwarf of the payors. All other street in the second plant as to make the second with the second second start to attend. 152 FIVE GRAINED SILTS, CLAYS, ORGANIC MATERIAL, OR "MUCK" SHAL 20 NOT BE USED TO CONSTRUCT THE PROPOSED CHAI INEL UNSUITABLE MATERIAL EXCAVATED FOR CHANNEL FEATURES SHALL BE DISPOSED METTOTA TAKE TAKA IN MELAND ACCOUNT ATTACHED IN A THETTOT OF THE THEF WE RANGE AND A PROPAGATION MONTH IN TO THE MEL THEM INTERN METTOTA IN METTO IN A DEBUG AND AND AND ATTACK AND AND A THE THE THE AND A DEBUG AND AND AND A THE ANT AT. ARR to billiofe a cost back as the cost of a cost of a cost of the state of the state. IVE POST AT MAKES AND DRAW "A District Station in and a subscription of the state of - NALE VERY DESCRIPTION OF SMALL PROPAGED IN THE PARTY. 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Design Demystified



Design Demystified



Design Recommendations

- Match the number of design levels to the complexity of the project, addressing all constraints.
- Naturalize channel morphology.
- Establish early communications with the landowner, abutters, and community.
- Share information with regulators prior to seeking permits.
- Be flexible to make field changes as new information becomes available during project.
- Form a cohesive project team to successfully design and build a project.

Thank You

