

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED
PROJECT 0009-451
LAWRENCE COUNTY
I-90 REST AREA
PICNIC SHELTER ROOF PRESERVATION
GLU-LAM BEAM REPLACEMENT



INDEX OF SHEETS

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SHEET NO. 7	EXISTING PLANS

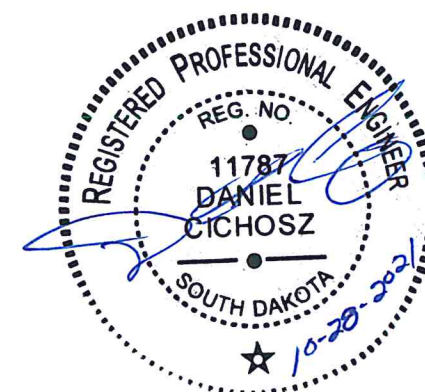
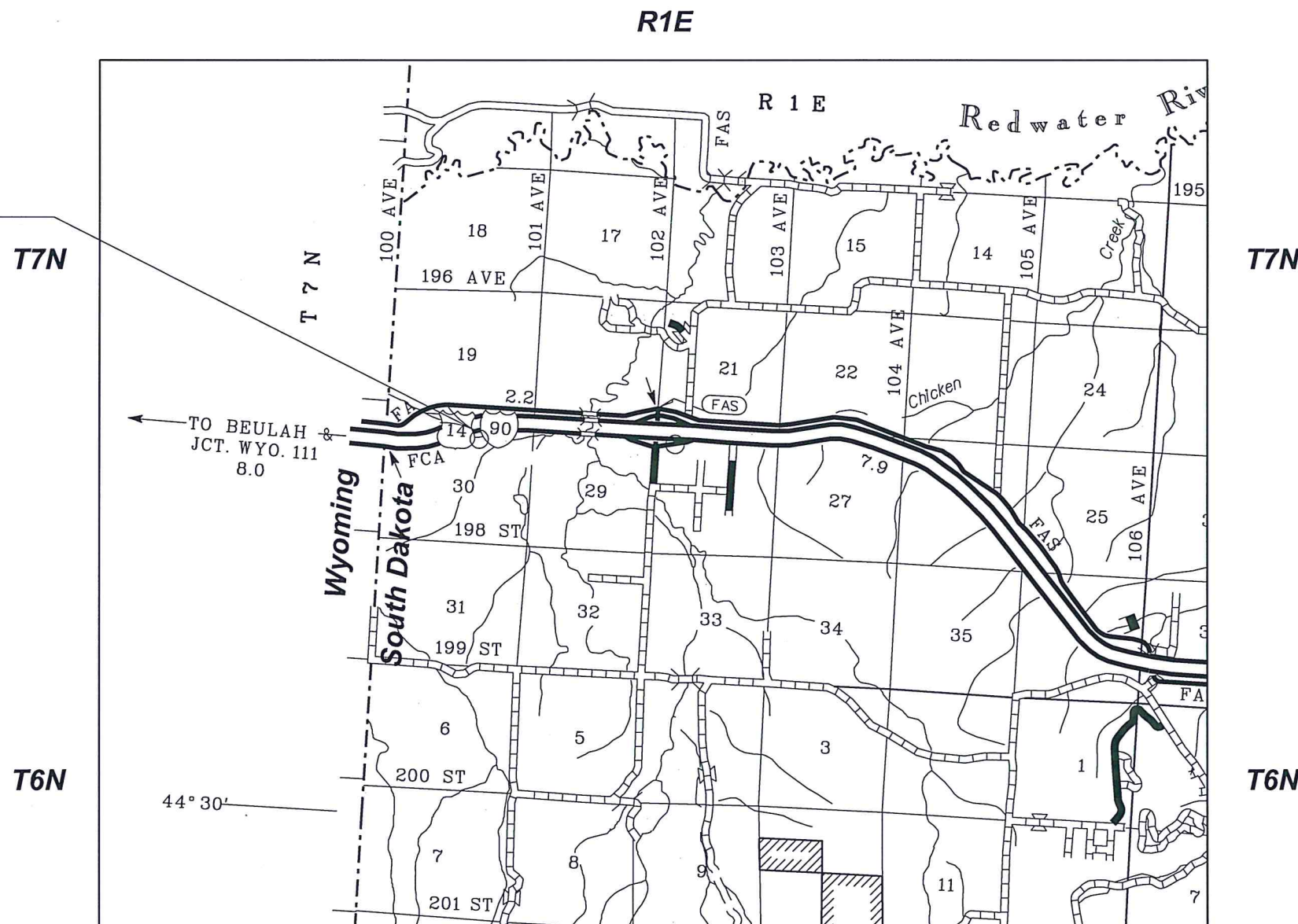
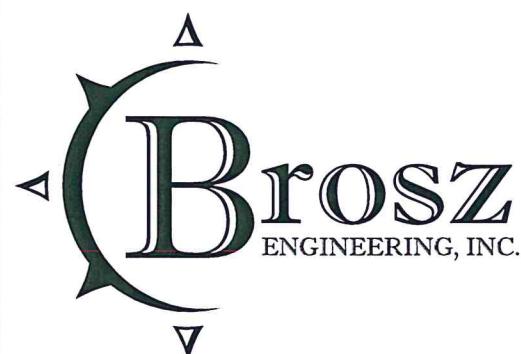
PROJECT LOCATION

Rest Area 1.0 Miles East of the
Wyoming Border On I-90 East Bound

Project Location
Rest Area Picnic Shelters

STORM WATER PERMIT DATA

None Required



ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
634E0110	Traffic Control Signs	8.0	SqFt
634E0120	Traffic Control, Miscellaneous	Lump Sum	LS
900E2022	Miscellaneous Construction, Masonry	Lump Sum	LS
900E6820	Remove and Replace Roofing Materials	Lump Sum	LS
900E6824	Remove and Replace Exterior Rotted Wood	Lump Sum	LS

SPECIFICATIONS

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 2015 Edition and Required Provisions, Supplemental Specifications, and Special Provisions as included in the Proposal.

DETAILS AND DIMENSIONS OF EXISTING STRUCTURE

All details and dimensions of the existing picnic shelters, contained in these plans, are provided as information only. It is the Contractor’s responsibility to inspect and verify the actual field conditions and any necessary dimensions affecting the satisfactory completion of the work required for this project.

SCOPE OF STRUCTURE WORK

All work on the structure shall be accomplished in a safe and satisfactory manner.

Install traffic control sidewalk closed signs on the sidewalks in front of each entrance to the picnic shelter. Provide orange construction fence around the perimeter of the work area at the end of each workday.

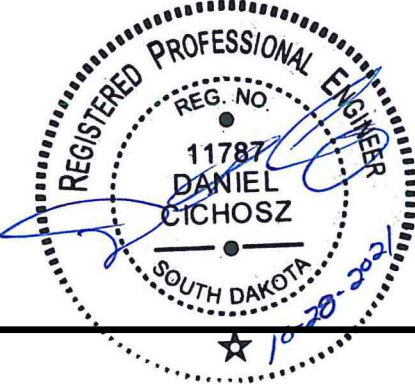
Remove & salvage the existing steel roof. Remove and dispose of the existing tongue and grove ceiling.

Support the existing 2x roof framing or remove the 2x roof framing. Remove all necessary fasteners, clips, nails & bolts in order to remove and replace the existing glu-lam beams. Remove some of the stone to access the bolts at the beam ends.

Remove and replace glu-lam beams. Install 2x roof framing, clips fasteners and bolts. Re-install steel roofing. Install new tongue and groove ceiling. Install new flashing around beams. Install stone and mortar the joints.

GOVERNING CODES:

- 1) INTERNATIONAL BUILDING CODE (IBC), 2020 EDITION
- 2) MANUAL FOR TIMBER CONSTRUCTION, AITC 4TH EDITION
- 3) BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-08
- 4) MANUAL OF STEEL CONSTRUCTION, AISC 2005 13TH EDITION



DESIGN LOADS AND CRITERIA:

Uniform Gravity Loads (PSF)		
Location	Dead Load	Live Load
Roof	10 PSF	41 PSF (+Drifting = 58 PSF Total)

Wind Criteria
Wind Speed = 120 MPH
Occupancy Category II
Exposure C

MATERIALS:

- 1) Structural Steel: Plates = ASTM A36, Fy = 36 KSI
HSS = ASTM A500 GRADE B
- 2) High Strength Bolts = ASTM A325, Steel to Steel Connections
- 3) Bolts = ASTM A307, Wood to Steel or Wood to Wood Connections
- 4) Headed Anchor Studs = ASTM A108 GRADE 1010-1020, TYPE B, Fu = 60 KSI
- 5) Weld Metal = F7X-EXXX OR E70XX Or as approved
- 6) Epoxy = Hilty HIT HY-150 FOR Concrete and Solid Masonry, or Hit HY-20 FOR Hollow Masonry Or Equivalent
- 7) Screw Anchors = ASTM B 633, Class SC1 TYPE III (Titen HD OR Equivalent)
- 8) Glu-Lam = Minimum 24FV4 DF/DF
- 9) Treated Doug Fir Rough Sawn DF Select Structural

FOUNDATIONS:

No work is anticipated around the foundations.
If any soil is disturbed the Contractor will provide positive drainage away from the structure.

REMOVE AND REPLACE ROOFING MATERIALS:

The steel roof will most likely need to be removed to gain access to the fasteners from the roof joints to the glu-lam beams. Care shall be taken when the roof is removed. All pieces shall be stacked neatly and secured from wind damage.

After the Treated Timber Beams are re-installed and all fasteners, clips, bolts are installed and complete the Steel Roof shall be re-installed. Any pieces lost or damaged will be replaced at the Contractors Expense. A roof sealant may be needed to ensure the roof doesn’t leak.

The ¾” tongue and groove ceiling will most likely need to be removed to gain access to the fasteners from the roof joints to the glu-lam beams. If any of the roof joists or intermediate framing are rotten, they will be replaced. The bottom joist, or lowest joist in elevation will need to be replaced on each shelter. The perimeter trim will need to be replaced. Care shall be taken when the roof ceiling is removed as to not damage other framing members or parts of the structure.

All of the ¾” Tongue and Groove pine boards, trim boards and wood will be replaced with new boards. All boards will need to be sealed with an exterior grade sealant, with a minimum of 20 year warranty on the sealant. Follow all manufactures recommendations.

All costs involved with removing the steel roof, re-installing the steel roof, removing, supplying, and installing the ¾” tongue and groove ceiling, trim boards, additional framing members, sealant will be incidental to the contract lump sum price for “Remove and Replace Roofing Materials”.

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	0009-451	2	7

REMOVE AND REPLACE EXTERIOR ROTTED WOOD:

The glu-lam beams will be replaced. The Contractor has the option to remove the existing roof joists or temporarily support them during the beam removal and replacement process.

The Contractor will remove all fasteners, bolts, and clips prior to removal of the existing glu-lam beams. The Contractor has the option to cut the beam in pieces during the removal process, care will be taken as to not damage other parts of the structure.

The intent of the design is for all items to be attached to each other and the surrounding structure, to perform as a system. Whether shown or not provide all accessories such as blocking, clips, stiffeners, and straps. Follow all manufactures recommendations for installation and use.

Framing connectors, anchors and hangers shown on the drawings are products of Simpson Strong Tie Company. Follow all manufactures recommendations for installation and use.

After the beams are replaced, all framing members shall be re-fastened. All roof joists shall be fastened with clips to the new beams. Any clips damaged or lost will be replaced with new clips and fasteners.

TREATED TIMBER BEAM

The Contractor has the option to use Glu-lam beam, solid sawn timber, or steel member. The timber components: 6”x18” beam or 5.125”x18” glu-lam will be a preservative treated to meet the requirements of AASHTO M 133. Copper Naphthenate is an acceptable preservative treatment. All cuts and holes in the new timber components shall be touched up with the same chemical that the wood was originally treated prior to installation. All bolts, threaded rods, nuts, washers, and nails are incidental to the contract lump sum price for “Remove and Replace Exterior Rotted Wood”.

All bolts, threaded rods nuts and washers shall be a minimum grade of A307 and all hardware shall be galvanized in accordance with ASTM A123 or A153. Any removal of existing timber, cutting, and trimming of timber and all work involved in installing the new timber components shall be incidental to the contract unit price per foot of “Treated Timber Beam”. All timber components shall be measured after installed and paid for at the contract lump sum price for “Remove and Replace Exterior Rotted Wood.”

The alternate steel beam options are: MC18X42.7, W16X26, HSS 16X4X0.3125 or HSS 18X6X0.25. If a steel member is proposed it shall be approved during the bid process. Also, the steel the beam will be powder coat painted to match the existing steel roof. All connections from the steel beam to the existing angle in the stone and the connection from the roof joists to the beam will meet or exceed the design strength of the timber connectors.

FLASHING/METAL WRAP

The flashing over the existing beam shall be removed during the beam removal process. New flashing or metal wrap shall encase the top and sides of the timber beam in the 5 ft to 6 ft zone below the roof drainage area. The color of the flashing shall match the existing roof. All costs involved with supplying and installing the flashing will be incidental to the contract lump sum price for “Remove and Replace Exterior Rotted Wood”.

MISCELLANEOUS CONSTRUCTION, MASONRY

Care shall be taken when removing the existing stone and mortar. The stone shall be reused or replaced with the same color of stone. If existing reinforcing steel is exposed, chip all loose mortal around the bar prior to reinstalling the stone. If the existing reinforcing steel is damaged or broke during the removal process, the bar shall be replaced with the existing size, spacing and embedment per standard specifications.

Grout all cells that include reinforcement, anchors, or structural embedments. Consolidate all grout with mechanical vibration. The entire bearing surface of the beam shall be grouted with non-shrink grout. The grout maybe installed in conjunction with the beam.

MISCELLANEOUS:

Reference to the Existing Architectural sheets for all other information.

Detail marks annotated on the plans are intended to indicate specific configurations and information. For clarity every location where a specific detail may apply is not annotated. Contact the Engineer if clarification is needed.

Coordinate opening and embedded items with all other trades.

Temporarily brace the structure to resist all loads or combinations of loads until all permanent elements are in place and all connections are complete.

TRAFFIC CONTROL SIGNS

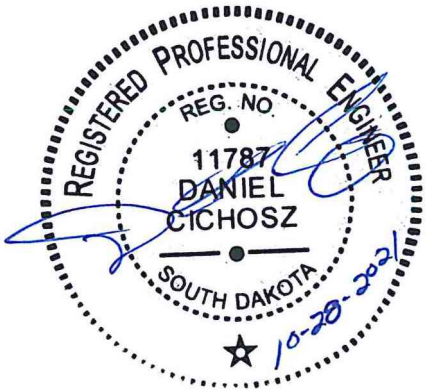
ITEMIZED LIST FOR TRAFFIC CONTROL SIGNS

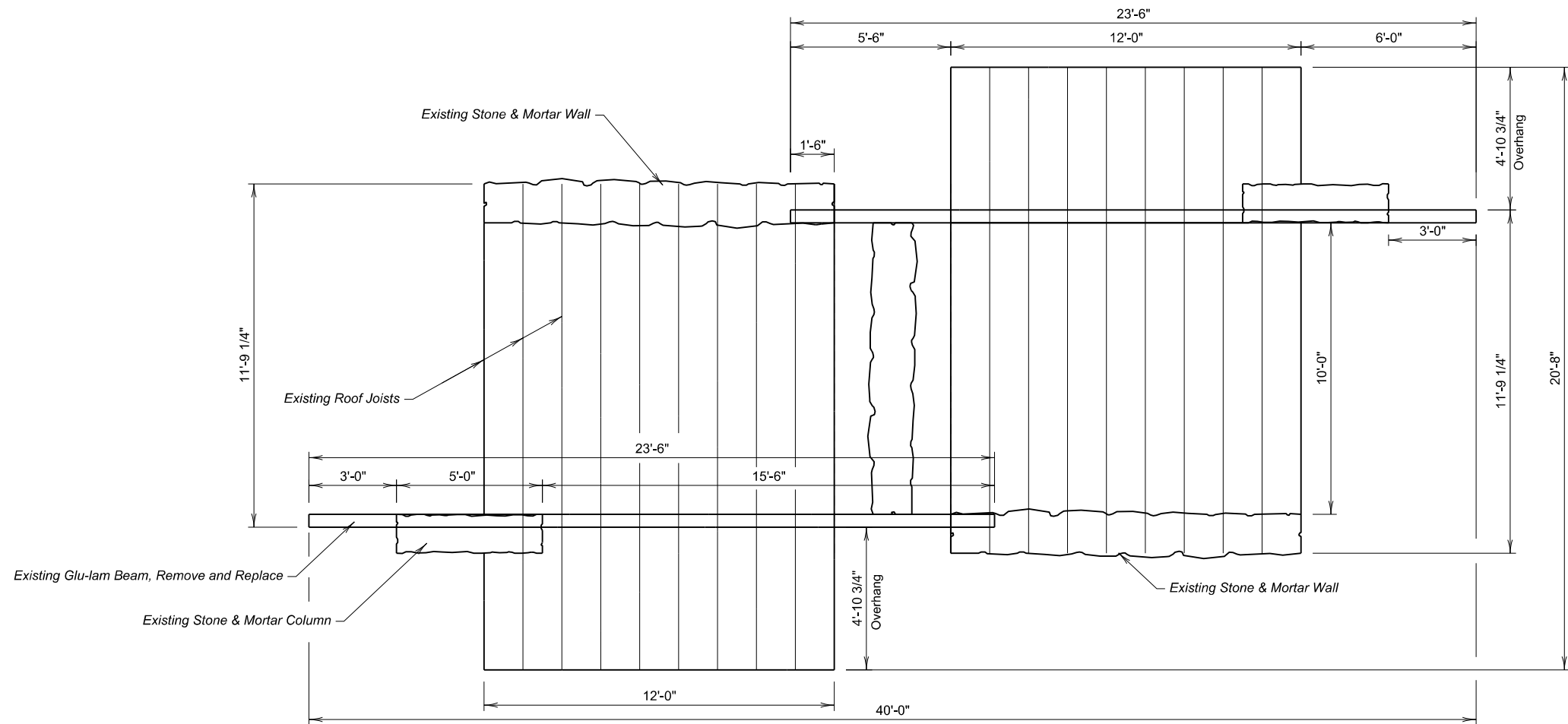
		CONVENTIONAL ROAD			
SIGN CODE	SIGN DESCRIPTION	NUMBER	SIGN SIZE	SQFT PER SIGN	SQFT
R9-9	SIDEWALK CLOSED	4	24" x 12"	2.0	8.0
		CONVENTIONAL ROAD TRAFFIC CONTROL SIGNS SQFT			
		8.0			

TRAFFIC CONTROL MISCELLANEOUS

All costs associated with traffic control shall be incidental to the contract lump sum price for Traffic Control Miscellaneous including supplying and installing the orange construction fence & posts; the removal & set-up of the fence each construction day; moving & resetting signs; and all incidentals

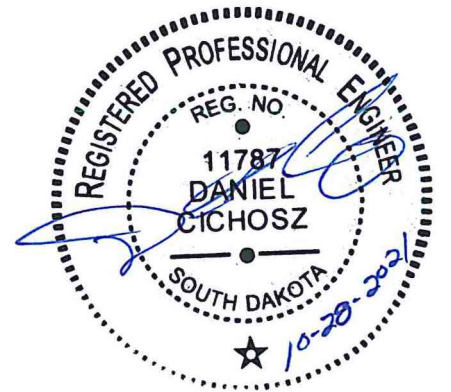
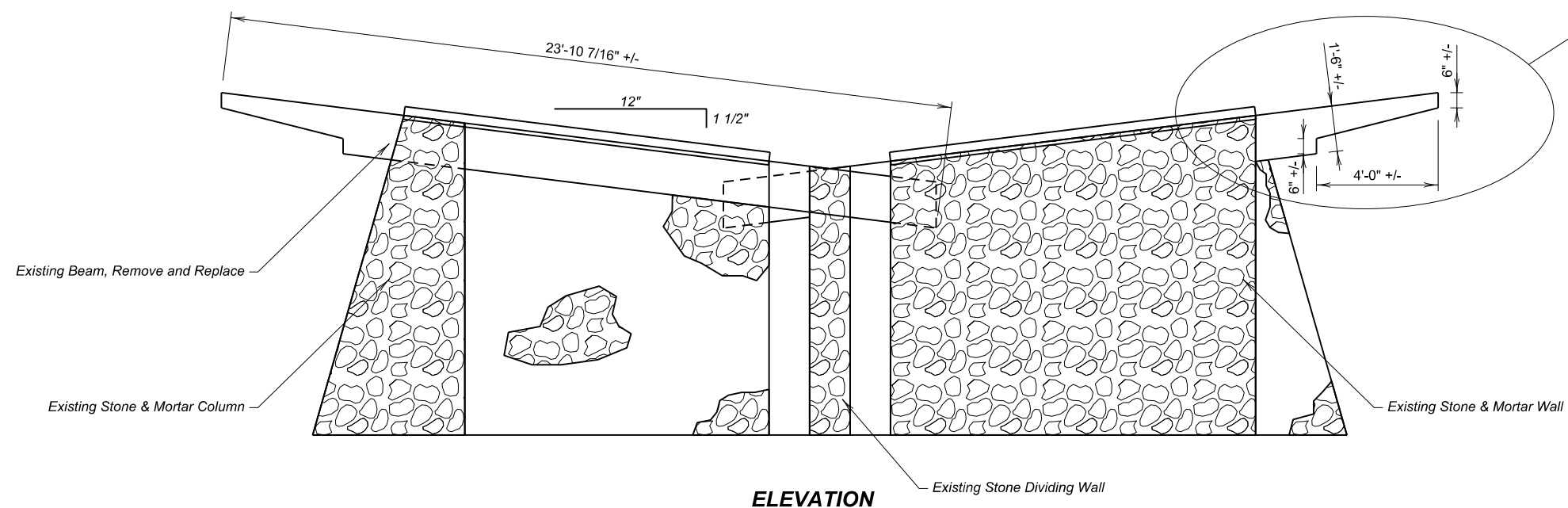
STATE OF SOUTH DAKOTA	PROJECT	SHEET NO.	TOTAL SHEETS
	0009-451	3	7





ROOF PLAN
(Picnic shelter)

Note:
Field Verify all Dimensions.
All Dimensions shown are +/- based on the
existing plan sheet on the last page in this set.



PICNIC SHELTER DETAILS

LAWRENCE CO.
S. D. DEPT. OF TRANSPORTATION
OCTOBER, 2021

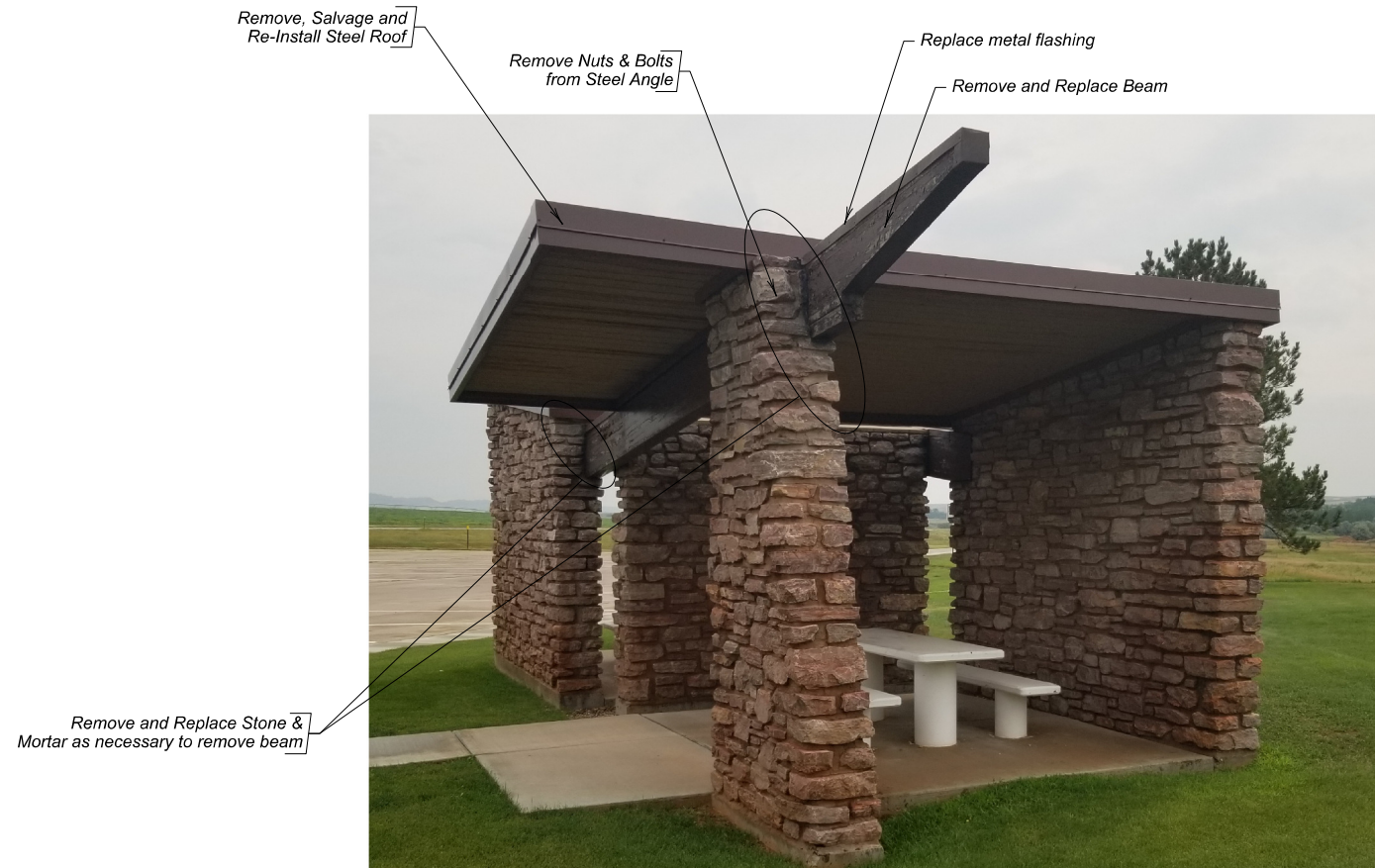
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	0009-451	5	7



EAST PICNIC SHELTER
(Looking West at Center Dividing Wall)

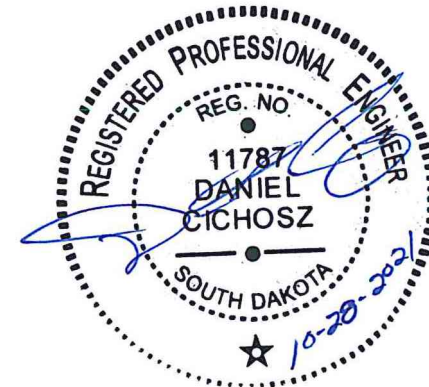


EAST PICNIC SHELTER
(Looking North at beam embedded in Stone Wall)



EAST PICNIC SHELTER
(Looking East)

Note:
There is most likely a tie down from each roof joist to the glu-lam beam.
Remove each fastener from the tie down prior to beam removal.



PICNIC SHELTER DETAILS

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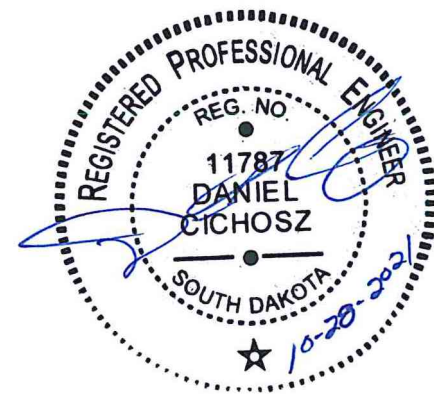
WEST PICNIC SHELTER
(Looking South)



WEST PICNIC SHELTER
(Looking West at beam embedded in Stone Wall)

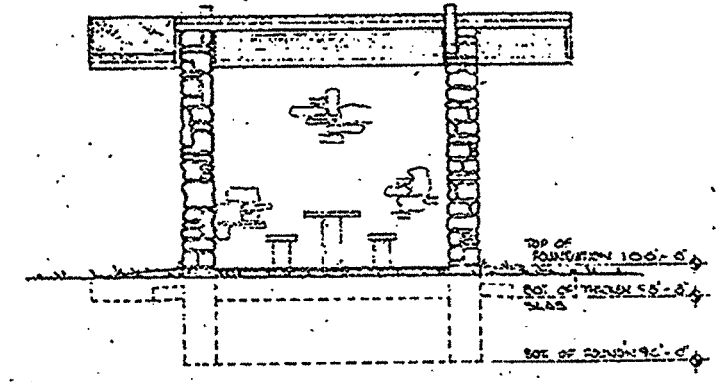
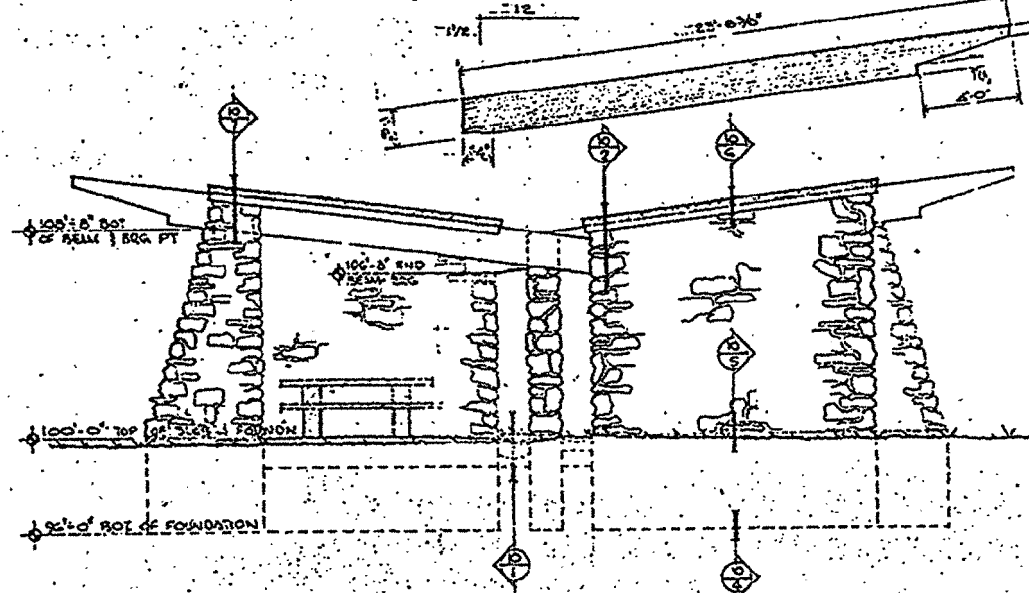
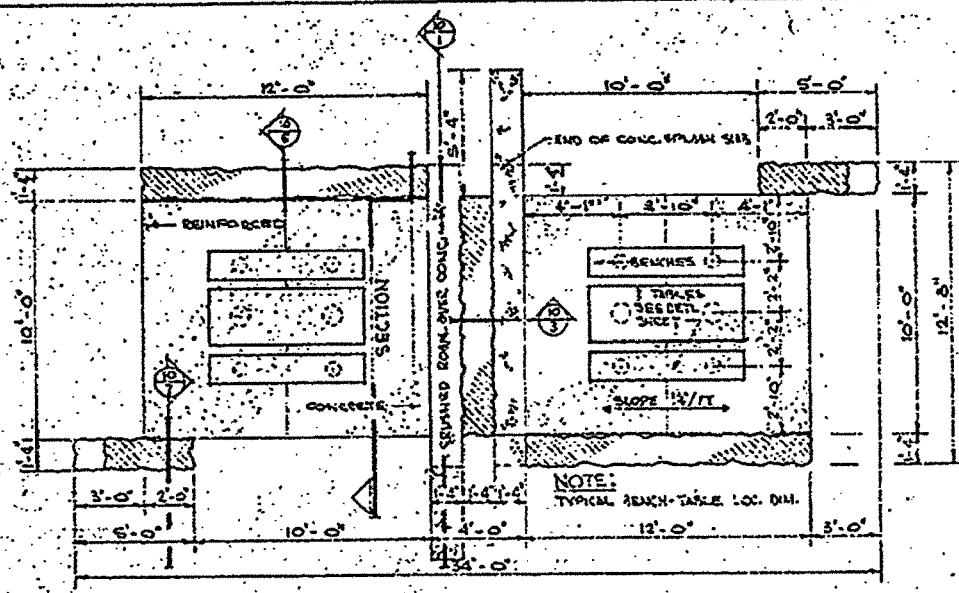


WEST PICNIC SHELTER
(Looking West at beam embedded in Stone Wall)



PICNIC SHELTER DETAILS

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OCTOBER, 2021

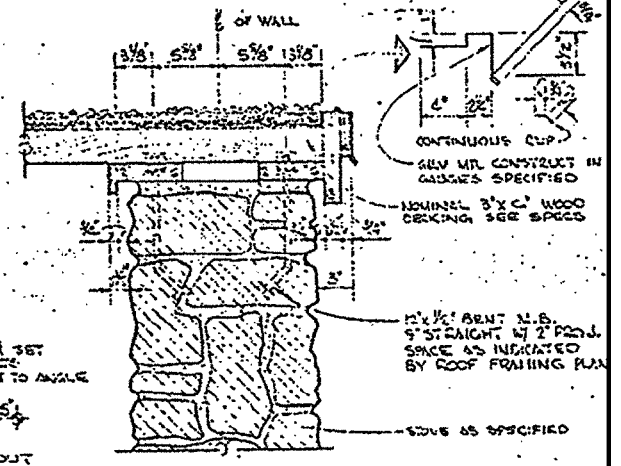
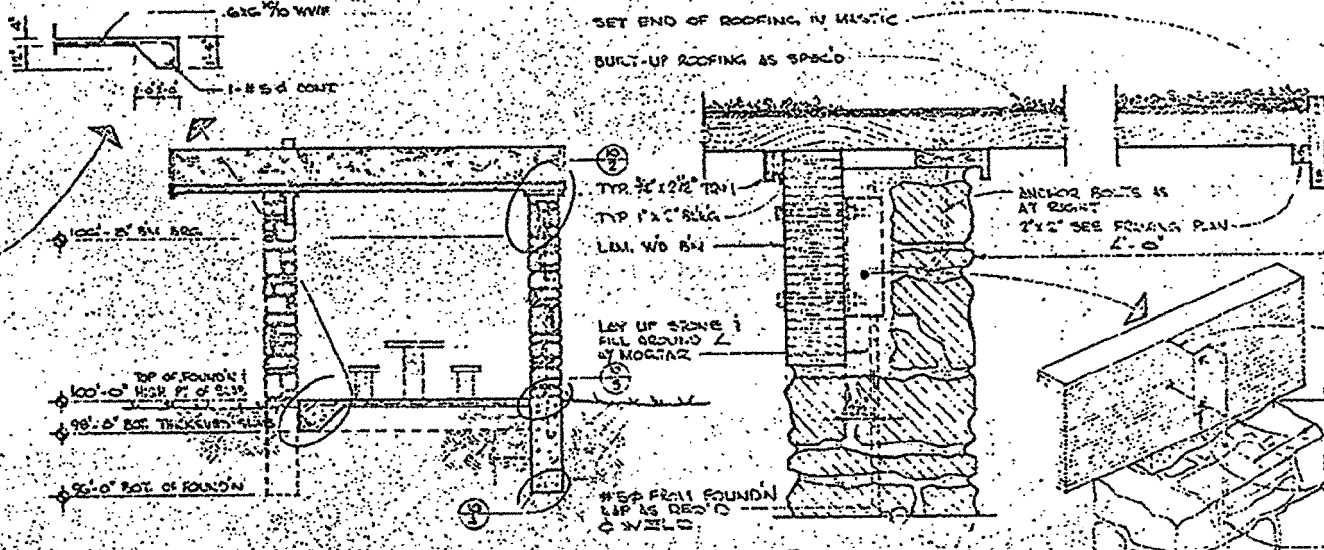
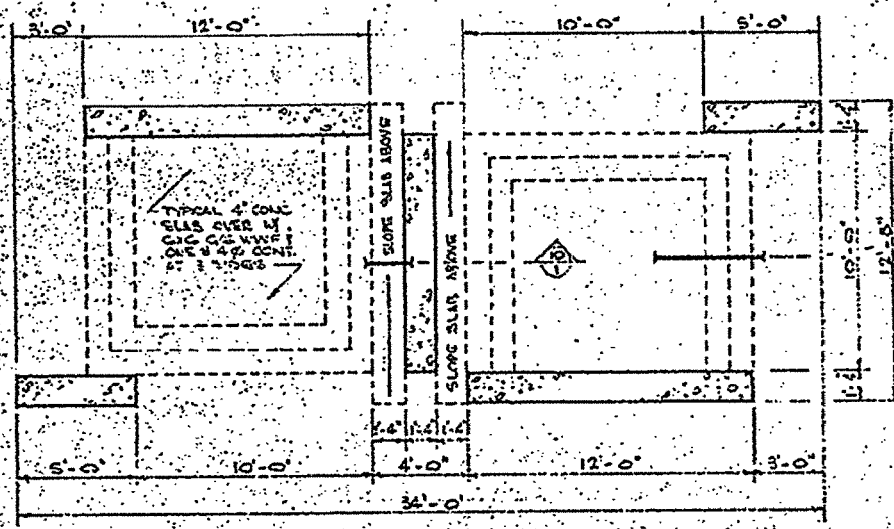


FLOOR PLAN

LONGITUDINAL SIDE ELEVATION

TRANSVERSE SIDE ELEV.

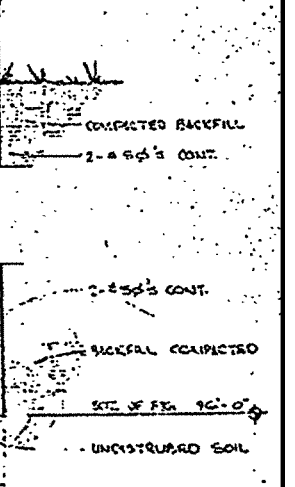
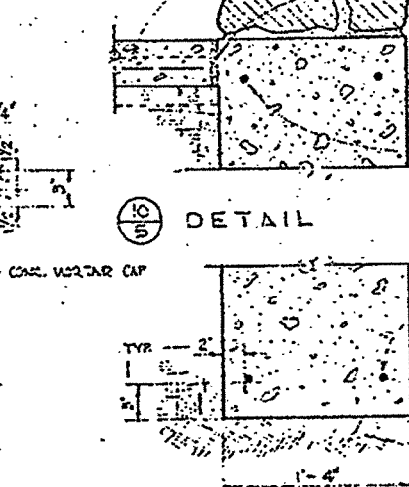
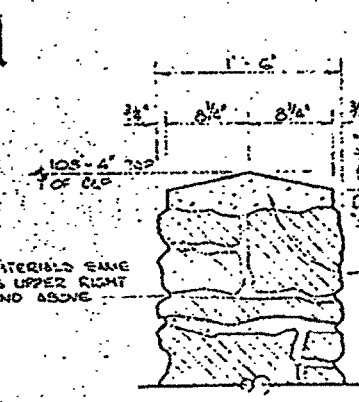
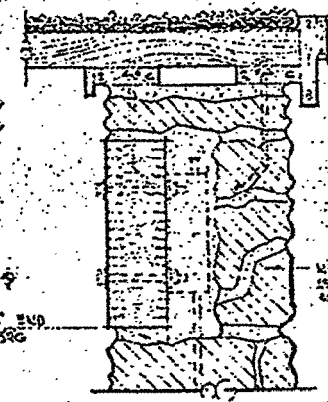
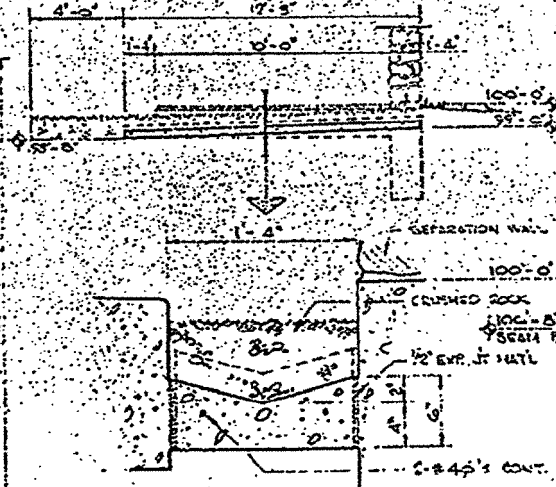
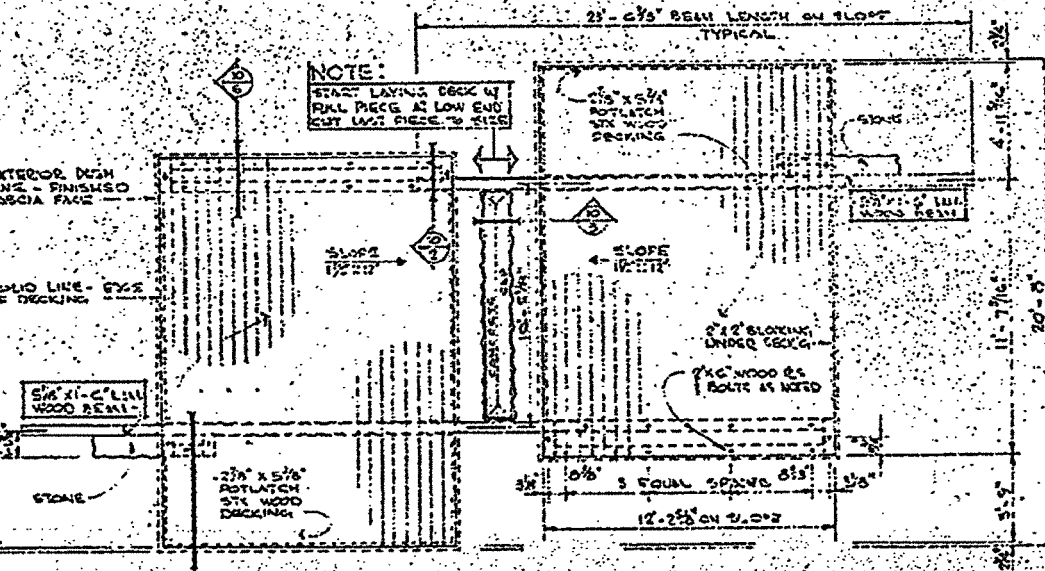
NOTE: SEE SITE PLAN FOR ORIENTATION & LAND.



FOUNDATION PLAN

TRANSVERSE SECTION

DETAIL 10/7



ROOF FRAMING PLAN

DETAIL 10/1

DETAIL 10/2

DETAIL 10/3

DETAIL 10/5

DETAIL 10/4

EXISTING PLANS