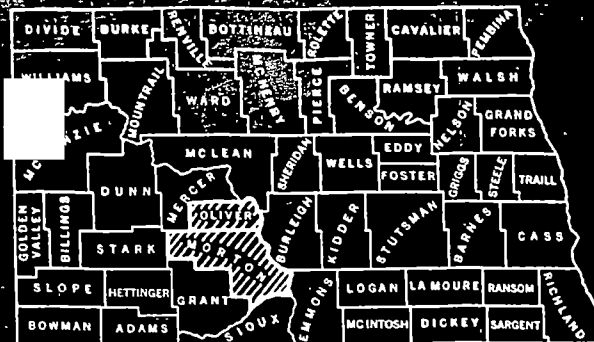




SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES



NORTH DAKOTA STATE HIGHWAY DEPARTMENT PLANS

FOR THE PROPOSED IMPROVEMENT OF A
STATE HIGHWAY
IN OLIVER & MORTON COUNTIES

FEDERAL AID SECONDARY PROJECT S.629(1)

INDEX OF DRAWINGS

SHEET NO.	TITLE PAGE
SHEET NO. 1	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
SHEET NO. 2	CULVERT AND BRIDGE LIST
SHEET NO. 3	TO 56 INCL. PLAN AND PROFILE DRAWINGS.
SHEET NO. 4	TO 47 INCL. STRUCTURAL DRAWINGS
SHEET NO. 5	TO 47 INCL. PROFILE
SHEET NO. 6	TO 210 INCL. CROSS SECTIONS

GOVERNING SPECIFICATIONS

Standard Specifications adopted by the North Dakota State Highway Department, Nov. 1942, and approved as standard by the Bureau of Public Roads, July 2, 1940. Required Special Provisions approved as standard by the Bureau of Public Roads, Aug. 5, 1940, and those submitted herewith.

KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES	
COUNTY LINE	
TOWNSHIP & RANGE LINES	
GRADE LINE	
CENTERLINE OF CONSTRUCTION	
OLD RIGHT OF WAY LINE	
NEW RIGHT OF WAY LINE	
ABANDONED RIGHT OF WAY LINE	
PROPERTY LINE	
STONE WALL	
OTHER FENCES	
POLE LINES	
POWER LINES	
BRIDGE	
GROUND	
GRADE	
TRAVELED WAY	
RAILROADS	
HEDGES AND TREES	
TRAILS	
CITY OR VILLAGE CORPORATE LIMITS	
SECTION CORNER	
QUARTER SECTION CORNER	
BUILDINGS	
OLD CULVERTS	
NEW CULVERTS	
DRAINAGE	
BENCH MARKS	
WATERS EDGE	
MARSH	
WIRE ROPE GUARD RAIL	
SNOW FENCE	
RIPRAP	
GUARD POSTS	
COBBLE GUTTERS	
CONCRETE GUTTERS	

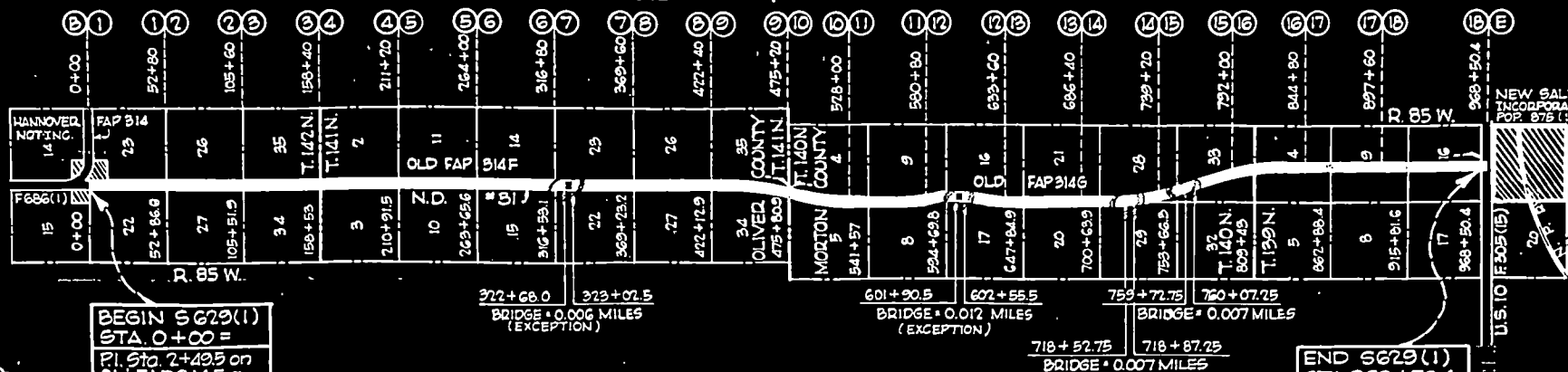
DESIGN DATA

TRAFFIC	AVERAGE DAILY	EST. 30TH MAX. HR.
PRESENT TRAFFIC (1951)	191 PASS. 94 TRUCKS 285 TOTAL	34
TRAFFIC FORECAST (1971)	339 PASS. 117 TRUCKS 456 TOTAL	55
DESIGN SPEED	60 MPH	
TRAFFIC CLASSIFICATION	M	
MINIMUM SIGHT DISTANCE (NON PASSING)	475 FEET	
MINIMUM SIGHT DISTANCE (SAFE PASSING)	2300 FEET	
MINIMUM PASSING SIGHT DISTANCE FOR MARKING	1000 FEET	
BRIDGES	MINIMUM WIDTH = 22 FEET DESIGN LOADING = H-20 (1949).	

SCALES
LAYOUT MAP 1" = 1000 FEET
PLAN & PROFILE 1" = 100 FEET
DRAWINGS 1" = 10 FEET
CROSS SECTIONS 1" = 10 FEET
STRUCTURAL DRAWINGS AS SHOWN

LENGTH OF PROJECT		
PROJECT	MILES-GROSS	MILES-NET
F629(1)	18.343	18.225
TOTALS	18.343	18.225

0.018 miles deducted
for Bridges.



BEGIN S629(1)
STA 0+00 =
Pl. Sta. 2+49.5 on
Old FAP 314 E =
Long. Sta. 686+61.7
on F.686(1).
NW Corner Sec. 23
T. 142 N. R. 85 W.

LAYOUT MAP

6000 FEET 0 6000 FEET

SCALE - FEET

F 1 31 ()
MILE 77 31-079.346

END S629(1)
STA 96+50.4 =
Sta. 494+76.4 on
Old FAP 314 E =
Sta. 497+57.4 on
S.N.E.P. 305(15).
A point 40' West
S.E. Corner of the
S.W. 1/4 of Sec. 16
T. 139 N. R. 85 W.



STRAIGHT LINE DIAGRAM OF
PASSING ZONES, NON-PASSING ZONES &
SAFE PASSING SECTIONS.

8000' 0' 8000'

SCALE - FEET

LEGEND

Passing Zones (1000' Minimum)
Non-Passing Zones
Safe Passing Sections (2300' Minimum)

SKETCH MAP OF OLIVER
AND MORTON COUNTIES

April 20, 1951
Revised to conform to P.S. & E.
All sheets affected

APPROVED DATE 4-24-51

E. R. Rushing
CHIEF ENGINEER, ACTING
NORTH DAKOTA STATE
HIGHWAY DEPARTMENT

RECOMMENDED FOR APPROVAL DATE

DISTRICT ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

APPROVED DATE

DIVISION ENGINEER
BUREAU OF PUBLIC ROADS
DEPARTMENT OF COMMERCE

DELAY PIPE CULVERTS

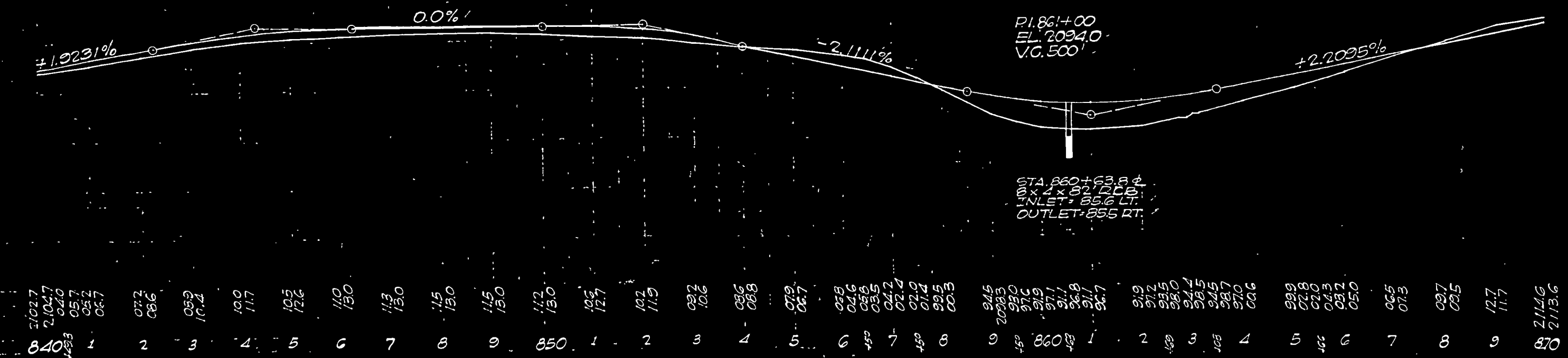
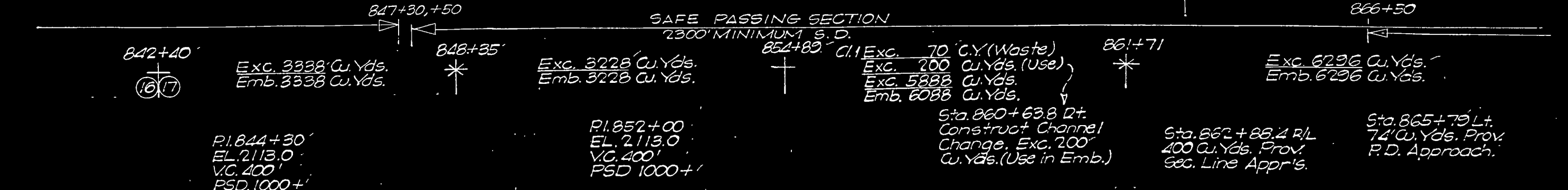
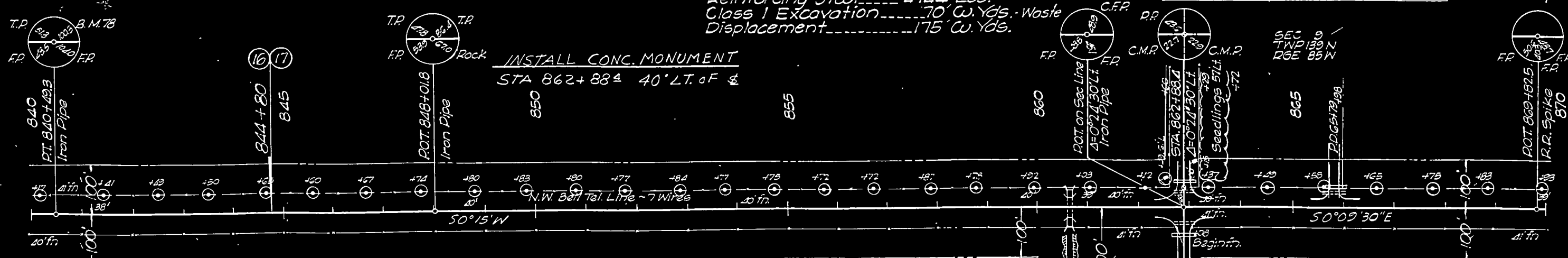
Sta. 862+88.4 Rt. 21" x 46' RCP from salvage
 Sta. 862+88.4 Lt. 21" x 46' RCP " " "
 Sta. 865+79 Lt. 15" x 44' RCP " " "

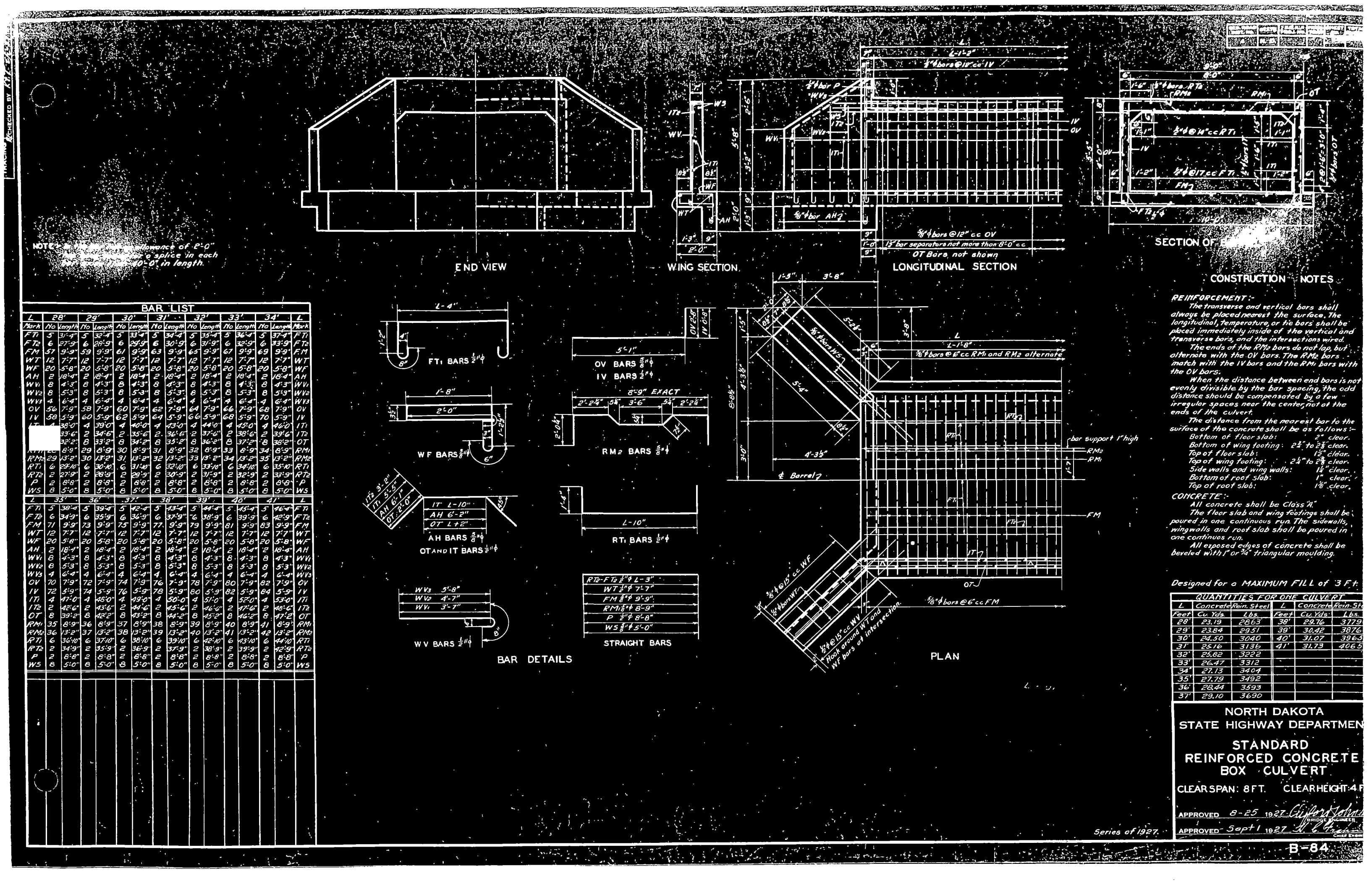
EXTEND BOX CULVERT

Sta. 860+63.8 ϕ Dwg. B84 & BEX-1
 8 x 4 x 32 RCB - Extend 25' RT & LT.
 Class A 1 1/2 Concrete 37.8 Cu. Yds.
 Reinforcing Steel 4744 Lbs.
 Class I Excavation 70 Cu. Yds. Waste
 Displacement 175 Cu. Yds.

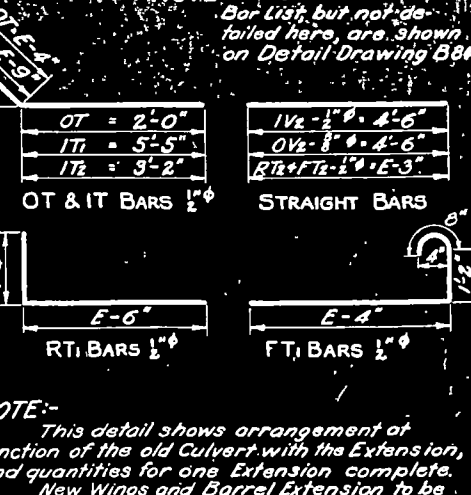
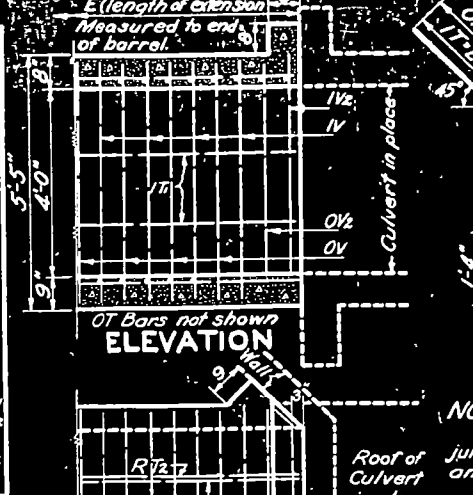
BENCH MARKS			
N ^o	DESCRIPTION	LOCATION	ELEV.
78	Lg. Emb Rock	841+43 - 32' Lt.	2105.43
79	Lg. Emb Rock	850+50 - 190' Lt.	2111.37
80	Spike in P.P.	863+16 - 100' Lt.	2095.77

FED. AID DIV. NO.	STATE	FED. AID PROJ. NO.	LOCAL PROJ. NO.	SHEET NO.	TOTAL SHEETS
				32	215





BAR LIST																	
E	25'	4'		5'		6'		7'		8'		E					
Mark	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	Mark				
FT	5	26.8	5	5.6	5	6.6	5	7.6	5	8.6	5	9.6	FT				
FL	6	24.9	6	3.9	6	4.9	6	5.9	6	6.9	6	7.9	FL				
FM	17	9.9	5	9.9	7	9.9	9	9.9	11	9.9	13	9.9	FM				
WT			6	7.7	6	7.7	6	7.7	6	7.7	6	7.7	WT				
WF			10	5.8	10	5.8	10	5.8	10	5.8	10	5.8	WF				
AH				18.4	1	18.4	1	18.4	1	18.4	1	18.4	AH				
WH	4	4.3	4	4.3	4	4.3	4	4.3	4	4.3	4	4.3	WH				
Wk	4	5.3	4	5.3	4	5.3	4	5.3	4	5.3	4	5.3	Wk				
WV	2	6.4	2	6.4	2	6.4	2	6.4	2	6.4	2	6.4	WV				
OV	48	7.9	6	7.9	8	7.9	10	7.9	12	7.9	14	7.9	OV				
OV	2	4.6	2	4.6	2	4.6	2	4.6	2	4.6	2	4.6	OV				
IV	50	5.9	8	5.9	10	5.9	12	5.9	14	5.9	16	5.9	IV				
IV	2	4.6	2	4.6	2	4.6	2	4.6	2	4.6	2	4.6	IV				
IT	4	2.5	4	2.5	4	2.5	4	2.5	4	2.5	4	2.5	IT				
IT	2	2.5	2	2.5	2	2.5	2	2.5	2	2.5	2	2.5	IT				
OT	8	2.5	8	2.5	8	2.5	8	2.5	8	2.5	8	2.5	OT				
RM	25	8.9	6	8.9	5	8.9	6	8.9	7	8.9	8	8.9	RM				
RH	26	13.2	5	13.2	6	13.2	7	13.2	8	13.2	9	13.2	RH				
RT	6	25.8	6	25.8	6	25.8	6	25.8	6	25.8	6	25.8	RT				
RT	6	25.8	6	25.8	6	25.8	6	25.8	6	25.8	6	25.8	RT				
WS	4	5.0	4	5.0	4	5.0	4	5.0	4	5.0	4	5.0	WS				

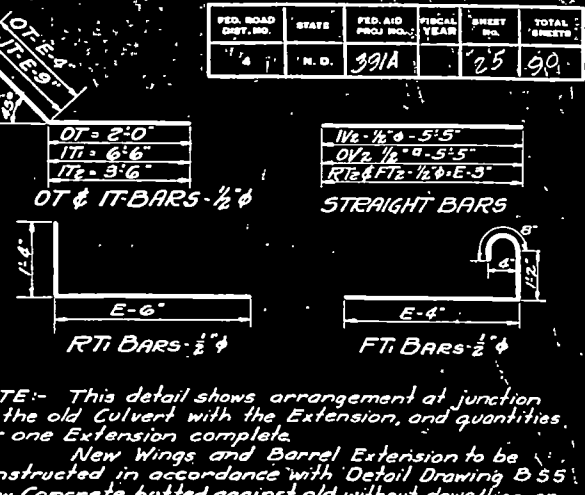
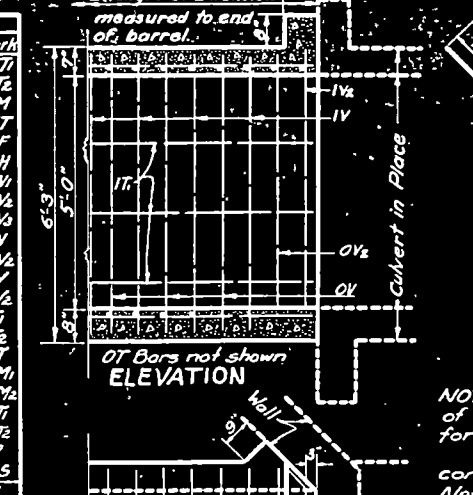


QUANTITIES FOR ONE EXTENSION

E	Concrete	Rein. Steel	E	Concrete	Rein. Steel
Cu Yds.	Lbs.	10'	Cu Yds.	Lbs.	1039 Lbs.
4'	5.09	501	11'	9.69	1123
5'	5.75	589	12'	10.35	1212
6'	6.40	678	13'	11.01	1300
7'	7.06	767			
8'	7.72	856	25'	18.9	2372
9'	8.38	944	21'	16.66	1954

EXTENSION FOR 8'x4' REINFORCED CONCRETE BOX CULVERT

BAR LIST																	
F	7'		6'		5'		4'		3'		2'		1.5'		E		
Mark	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	
FT	3	8'-6"	3	9'-6"			3	12'-6"			3	16'-6"			3	16'-6"	
FL	6	6'-9"	6	7'-9"				10'-9"			6	14'-9"			6	14'-9"	
FM	9'	6'-11"	11	6'-11"			15	6'-11"			23	6'-11"			23	6'-11"	
WT	6	8'-9"	6	8'-9"			6	8'-9"			6	8'-9"			6	8'-9"	
WF	14	6'-7"	14	6'-7"			14	6'-7"			14	6'-7"			14	6'-7"	
AN	1	17'-2"	1	17'-2"			1	17'-2"			1	17'-2"			1	17'-2"	
WV	6	4'-8"	6	4'-8"			6	4'-8"			6	4'-8"			6	4'-8"	
WZ	4	6'-2"	4	6'-2"			4	6'-2"			4	6'-2"			4	6'-2"	
WY	4	7'-1"	4	7'-1"			4	7'-1"			4	7'-1"			4	7'-1"	
OV	10	7'-7"	12	7'-7"			16	7'-7"			24	7'-7"			24	7'-7"	
OV	2	5'-5"	2	5'-5"			2	5'-5"			2	5'-5"			2	5'-5"	
IV	12	6'-8"	14	6'-8"			18	6'-8"			26	6'-8"			26	6'-8"	
IV	2	5'-5"	2	5'-5"			2	5'-5"			2	5'-5"			2	5'-5"	
IT	6	12'-9"	6	13'-9"			6	16'-9"			6	20'-9"			6	20'-9"	
IT	2	9'-9"	2	10'-9"			2	13'-9"			2	17'-9"			2	17'-9"	
OT	8	8'-8"	8	9'-8"			8	12'-8"			8	16'-8"			8	16'-8"	
RM	6	5'-11"	7	5'-11"			9	5'-11"			13	5'-11"			13	5'-11"	
RM	7	10'-3"	8	10'-3"			10	10'-3"			14	10'-3"			14	10'-3"	
RT	3	7'-10"	3	8'-10"			3	11'-10"			3	15'-10"			3	15'-10"	
RT	2	6'-9"	2	7'-9"			2	10'-9"			2	14'-9"			2	14'-9"	
P	1	5'-8"	1	5'-8"			1	5'-8"			1	5'-8"			1	5'-8"	
WS	4	5'-0"	4	5'-0"			4	5'-0"			4	5'-0"			4	5'-0"	
F	18	30'	10'	30'			21'	30'			32'	30'			52'	30'	

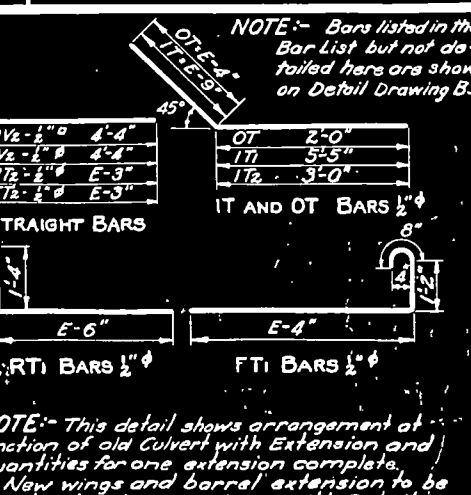
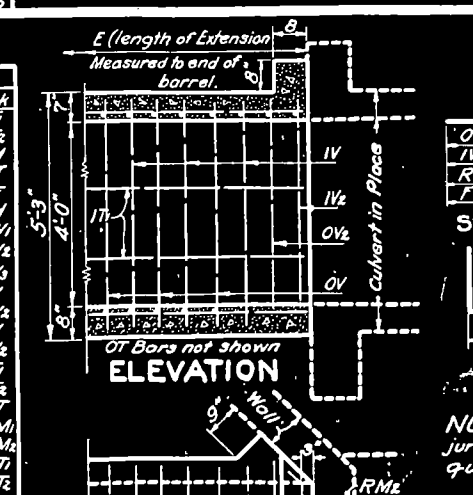


QUANTITIES FOR ONE EXTENSION

E	Concrete	Rein. Steel	E	Concrete	Rein. Steel
Cu Yds.	Lbs.	10'	Cu Yds.	Lbs.	1039 Lbs.
7'	6.97	657	18'	12.86	1357
8'	7.51	729	19'	13.40	1428
			20'	13.93	1500
11'	9.11	896	21'	14.47	1574
			22'	15.00	1646
15'	11.25	1188	32'	20.35	2271

EXTENSION FOR 5'x5' REINFORCED CONCRETE BOX CULVERT

BAR LIST																	
E	No.		4'		5'		6'		7'		8'		E				
Mark	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	No.	Length	Mark		
FT1	3	4'-6"	3	5'-6"	3	6'-6"	3	7'-6"	3	8'-6"	3	9'-6"	FT1	3	4'-6"		
FT2	6	2'-9"	6	3'-9"	6	4'-9"	6	5'-9"	6	6'-9"	6	7'-9"	FT2	6	2'-9"		
FM1	2	6'-9"	4	6'-9"	6	6'-9"	8	6'-9"	10	6'-9"	12	6'-9"	FM1	2	6'-9"		
WT	6	7'-7"	6	7'-7"	6	7'-7"	6	7'-7"	6	7'-7"	6	7'-7"	WT	6	7'-7"		
WF	10	5'-7"	10	5'-7"	10	5'-7"	10	5'-7"	10	5'-7"	10	5'-7"	WF	10	5'-7"		
AH	1	15'-4"	1	15'-4"	1	15'-4"	1	15'-4"	1	15'-4"	1	15'-4"	AH	1	15'-4"		
WW	4	4'-1"	4	4'-1"	4	4'-1"	4	4'-1"	4	4'-1"	4	4'-1"	WW	4	4'-1"		
WV	4	5'-3"	4	5'-3"	4	5'-3"	4	5'-3"	4	5'-3"	4	5'-3"	WV	4	5'-3"		
WV	2	6'-4"	2	6'-4"	2	6'-4"	2	6'-4"	2	6'-4"	2	6'-4"	WV	2	6'-4"		
OV	2	6'-7"	4	6'-7"	6	6'-7"	8	6'-7"	10	6'-7"	12	6'-7"	OV	2	6'-7"		
IV	4	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	IV	4	4'-4"		
IV	4	5'-7"	6	5'-7"	8	5'-7"	10	5'-7"	12	5'-7"	12	5'-7"	IV	4	5'-7"		
IV	2	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	2	4'-4"	IV	2	4'-4"		
IT	4	7'-8"	4	8'-8"	4	9'-8"	4	10'-8"	4	11'-8"	4	12'-8"	IT	4	7'-8"		
IT	2	5'-3"	2	6'-3"	2	7'-3"	2	8'-3"	2	9'-3"	2	10'-3"	IT	2	5'-3"		
OT	8	4'-8"	8	5'-8"	8	6'-8"	8	7'-8"	8	8'-8"	8	9'-8"	OT	8	4'-8"		
RM	2	5'-9"	3	5'-9"	4	5'-9"	5	5'-9"	6	5'-9"	6	5'-9"	RM	2	5'-9"		
RM	3	10'-1"	4	10'-1"	5	10'-1"	6	10'-1"	7	10'-1"	7	10'-1"	RM	3	10'-1"		
RT	3	3'-10"	3	4'-10"	3	5'-10"	3	6'-10"	3	7'-10"	3	8'-10"	RT	3	3'-10"		
RT	2	2'-9"	2	3'-9"	2	4'-9"	2	5'-9"	2	6'-9"	2	7'-9"	RT	2	2'-9"		



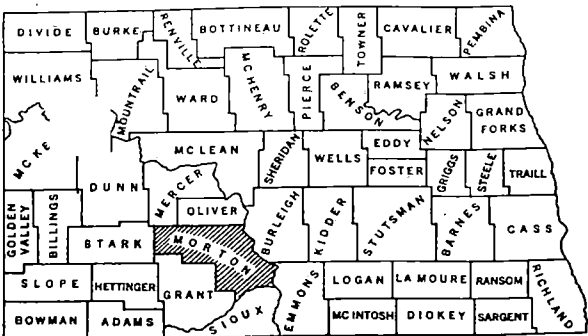
QUANTITIES FOR ONE EXTENSION

E	Concrete	Rein. Steel	E	Concrete	Rein. Steel
Cu Yds.	Lbs.	10'	Cu Yds.	Lbs.	1039 Lbs.
3'	3.61	307	11'	7.30	800
4'	4.07	375	12'	7.90	864
5'	4.53	444	13'	8.50	928
6'	5.00	510	21'	11.90	1389
7'	5.46	577	22'	12.36	1464
8'	5.92	623	19'	11.00	1295
9'	6.38	664	27'	14.67	1787

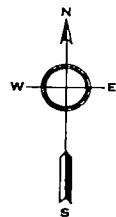
EXTENSION FOR 5'x7' REINFORCED CONCRETE BOX CULVERT

BAR LIST

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SKETCH-MAP OF NORTH DAKOTA
SHOWING COUNTIES



SCALES
LAYOUT SHEET: 1 IN. = 1 MI.
PLAN AND PROFILE DRAWINGS: HOR. 1 IN. = 100 FT. VERT. 1 IN. = 10 FT.
STRUCTURAL DRAWINGS: AS SHOWN
CROSS SECTION SHEETS: 1 IN. = 5 FT.

NORTH DAKOTA STATE HIGHWAY COMMISSION

PLANS

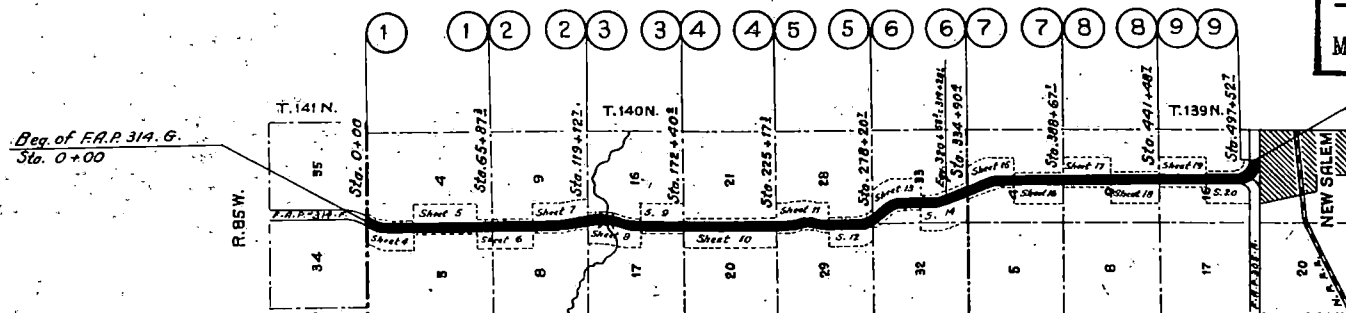
FOR THE PROPOSED IMPROVEMENT OF A

STATE HIGHWAY

IN MORTON COUNTY

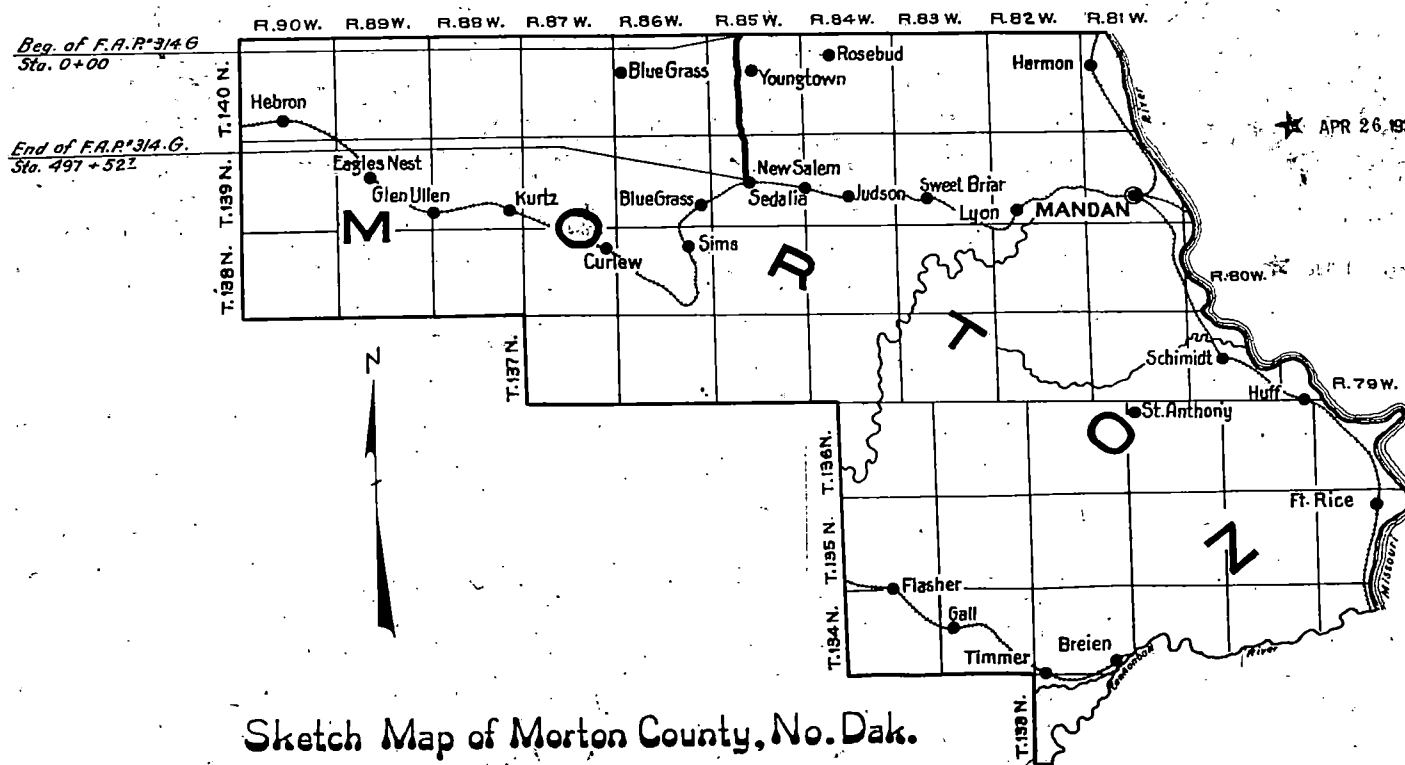
FEDERAL AID PROJECT NO. 314-G.

DESCRIPTION: Beg. at Sta. 0+00 a point 364.4 ft. East of the N.W. Cor. of Sec. 4 - T. 140 N. R. 85 W. - thence Southwesterly to Sta. 14+04.9 - thence South on Sec. line approx. 2 miles to Sta. 109+42.2 thence Southeasterly and Southwesterly to Sta. 143+85.9 thence South on Sec. line to Sta. 233+42.2 - thence in a General Southeasterly direction to Sta. 358+33.2 said point being 40 ft. west of the 1/4 Sec. line - thence South approx. 2.5 miles to Sta. 488+56.2 thence Southeasterly to Sta. 497+52.2 a point 529.5 ft. East of the South 1/4 Sec. Cor. of Sec. 16 - T. 139 N. R. 85 W., said point equals Sta. 508+56.4 on F.A.P. 305 - A. The end of F.A.P. 314 - G.



LAYOUT MAP

Scale 1 in. = 1 mi.



Sketch Map of Morton County, No. Dak.

INDEX OF DRAWINGS

SHEET NO.	TITLE PAGE
1	TYPICAL SECTIONS & SUMMARY OF QUANTITIES
2	CULVERT & BRIDGE LIST
3	TO 20 INCL. PLAN AND PROFILE DRAWINGS
4	TO 30 INCL. STRUCTURAL DRAWINGS
5	TO 40 INCL. CROSS SECTIONS

SPECIFICATIONS TO GOVERN, AS SUBMITTED FOR APPROVAL MAR. 26, 1932

KEY TO CONVENTIONAL SIGNS

STATE & NATIONAL LINES	
COUNTY LINE	
TOWNSHIP & RANGE LINES	
GRADE LINE	
CENTERLINE OF CONSTRUCTION	
OLD RIGHT OF WAY LINE	
NEW RIGHT OF WAY LINE	
ABANDONED RIGHT OF WAY LINE	
PROPERTY LINE	
STONE WALL	
OTHER FENCES	
POLE LINES	
POWER LINES	
BRIDGE	
GROUND ELEVATION	
TRAVELED WAY	
RAILROADS	
HEDGES AND TREES	
TRAILS	
CITY OR VILLAGE CORPORATE LIMITS	
SECTION CORNER	
QUARTER SECTION CORNER	
BUILDINGS	
OLD CULVERTS	
NEW CULVERTS	
DRAINAGE	
BENCH MARKS	
WATERS EDGE	
MARSH	
WIRE ROPE GUARD RAIL	
SNOW FENCE	
RIPRAP	
GUARDS POSTS	
COBBLE GUTTERS	
CONCRETE GUTTERS	

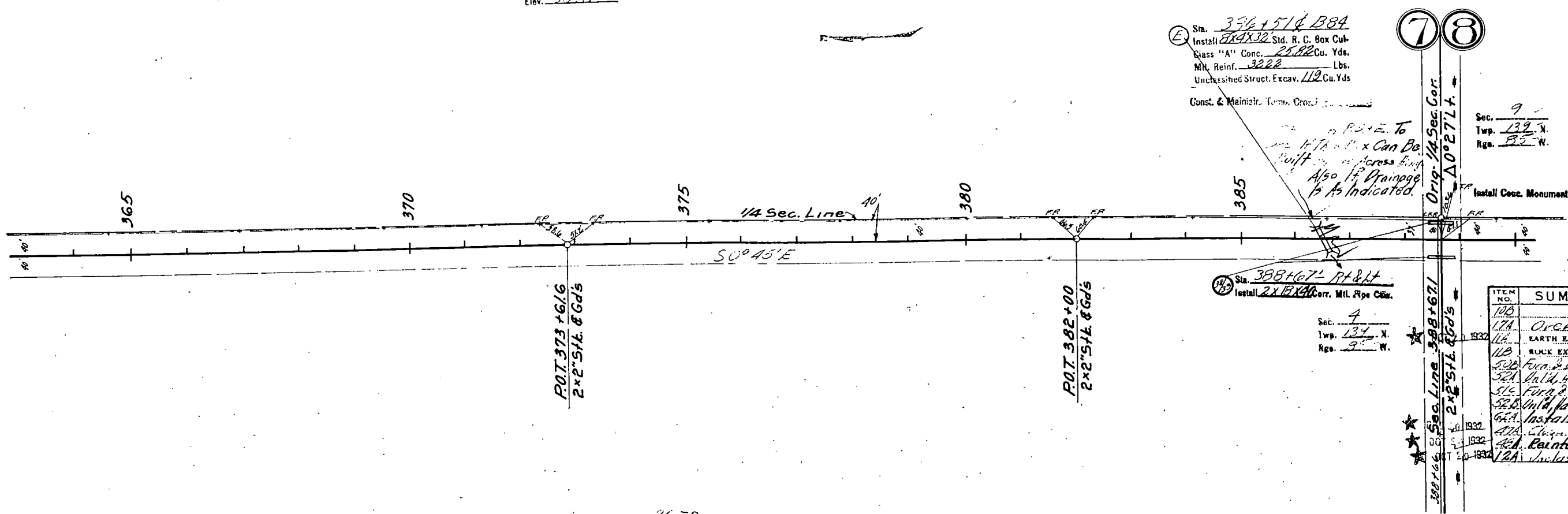
SYSTEM DIST. HWY. AGREEMENT

F - 1 - 31 ()
MILE 86

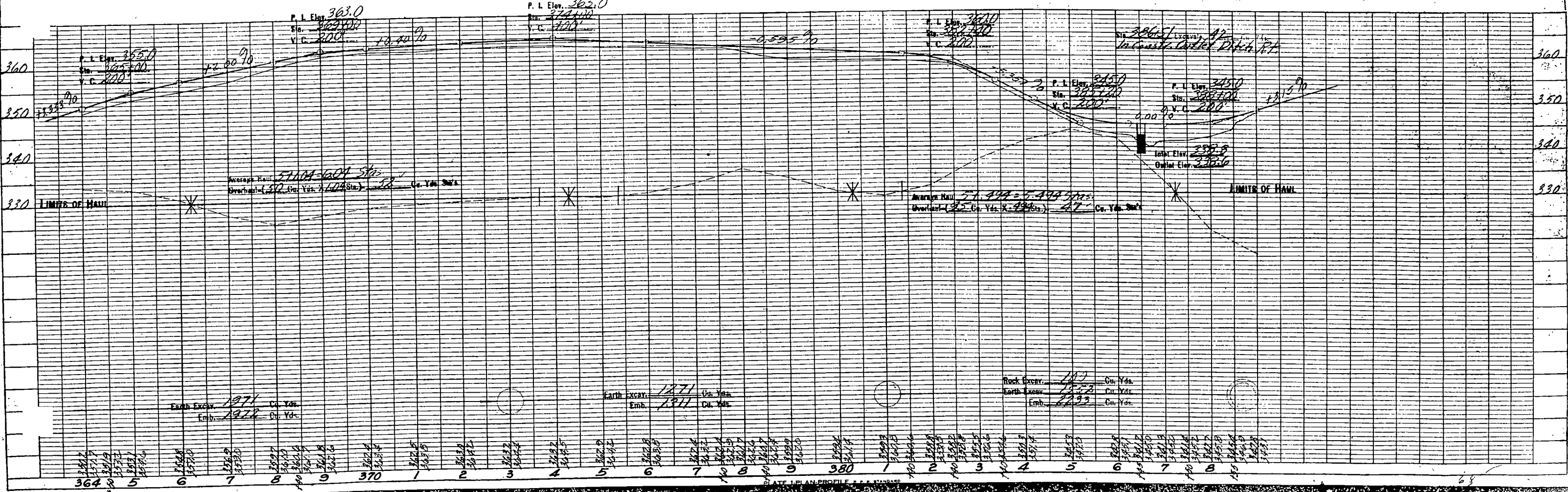
★ APR 26 1932
Notes: Revised to conform to B. P. R. Letter of Comments dated 4-22-1932.
Sheets affected are as follows:
Nos. 1-2-3-4-5-6-7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-1053-1054-1055-1056-1057-1058-1059-1060-1061-1062-1063-1064-1065-1066-1067-1068-1069-1070-1071-1072-1073-1074-1075-1076-1077-1078-1079-1080-1081-1082-1083-1084-1085-1086-1087-1088-1089-1090-1091-1092-1093-1094-1095-1096-1097-1098-1099-1100-1101-1102-1103-1104-1105-1106-1107-1108-1109-1110-1111-1112-1113-1114-1115-1116-1117-1118-1119-1120-1121-1122-1123-1124-1125-1126-1127-1128-1129-1130-1131-1132-1133-1134-1135-1136-1137-1138-1139-1140-1141-1142-1143-1144-1145-1146-1147-1148-1149-1150-1151-1152-1153-1154-1155-1156-1157-1158-1159-1160-1161-1162-1163-1164-1165-1166-1167-1168-1169-1170-1171-1172-1173-1174-1175-1176-1177-1178-1179-1180-1181-1182-1183-1184-1185-1186-1187-1188-1189-1190-1191-1192-1193-1194-1195-1196-1197-1198-1199-1200-1201-1202-1203-1204-1205-1206-1207-1208-1209-1210-1211-1212-1213-1214-1215-1216-1217-1218-1219-1220-1221-12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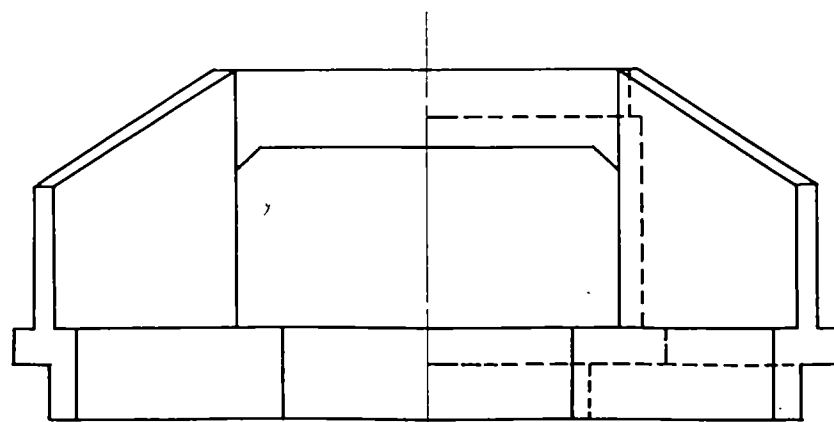
B. M. No. 31-282 Hub by F.P.
Sta. 373+23 ~ 48 ft.
Elev. 363.78

PRG. ROAD DIST. (MI.)	STATE	PRG. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	N.D.	3146	32	16	117

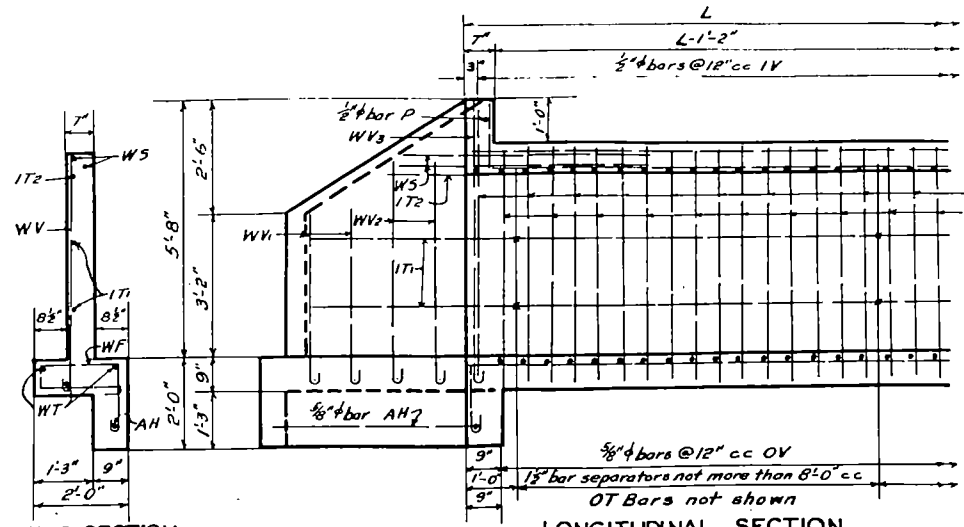


ITEM NO.	SUMMARY--MILE 7	QUANTITY	UNIT
100	AND GRUBBING		ACRD
101	Overhaul	326	Cu. Yds.
102	EARTH EXCAVATION	12383	Cu. Yds.
103	ROCK EXCAVATION	100	Cu. Yds.
104	500' Cor. & 21' 18" C.M.P.	80	Lin. Ft.
105	500' Viald. & 18" 18" C.M.P.	80	"
106	512' Form. & 14" 18" C.C.P.	36	"
107	525' Viald. & 18" 18" R.C.P.	36	"
108	644' Install Conc. Man.	12	"
109	472' 2' 18" 18" Gage	5380	Cu. Yds.
110	481' Reinforcing Steel	6014	Lbs.
111	12A Uncluss. Struct. Exc.	200	Cu. Yds.



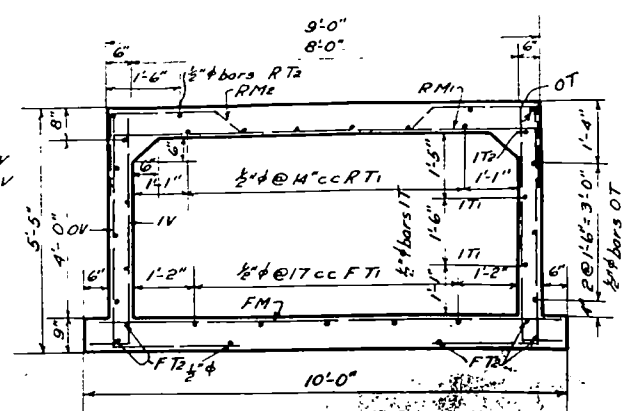


END VIEW



WING SECTION

LONGITUDINAL SECTION



SECTION OF BARREL

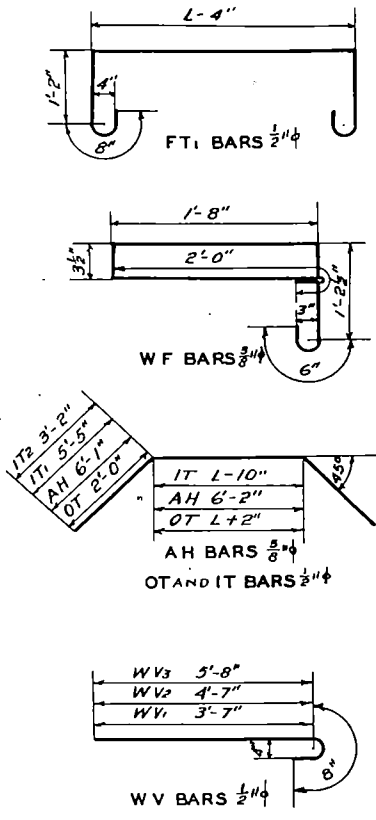
CONSTRUCTION NOTES

REINFORCEMENT:-
 The transverse and vertical bars shall always be placed nearest the surface. The longitudinal, temperature, or tie bars shall be placed immediately inside of the vertical and transverse bars, and the intersections wired.
 The ends of the RMe bars do not lap, but alternate with the OV bars. The RMe bars match with the IV bars and the RMe bars with the OV bars.
 When the distance between end bars is not evenly divisible by the bar spacing, the odd distance should be compensated by a few irregular spaces near the center, not at the ends of the culvert.
 The distance from the nearest bar to the surface of the concrete shall be as follows:-
 Bottom of floor slab: 2" clear.
 Bottom of wing footing: 2 1/2" to 2 3/4" clear.
 Top of floor slab: 1 1/2" clear.
 Top of wing footing: 2 1/2" to 2 3/4" clear.
 Side walls and wing walls: 1 1/2" clear.
 Bottom of roof slab: 1" clear.
 Top of roof slab: 1 1/2" clear.

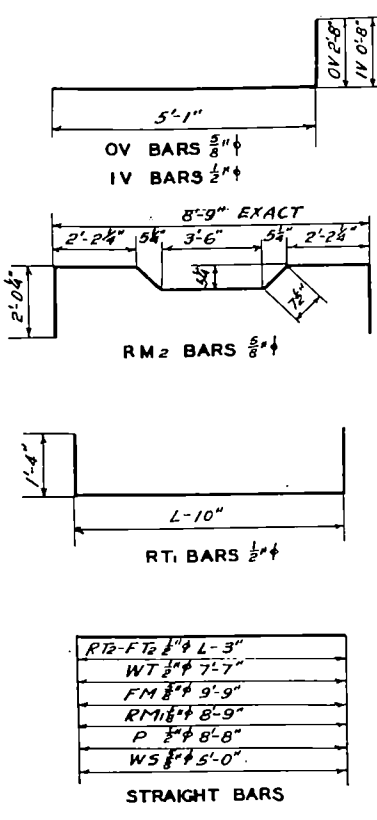
CONCRETE:-
 All concrete shall be Class "A".
 The floor slab and wing footings shall be poured in one continuous run. The side walls, wing walls and roof slab shall be poured in one continuous run.
 All exposed edges of concrete shall be beveled with 1" or 2" triangular moulding.

NOTE:- In the bar list an allowance of 2'-0" has been made for a splice in each bar more than 40'-0" in length.

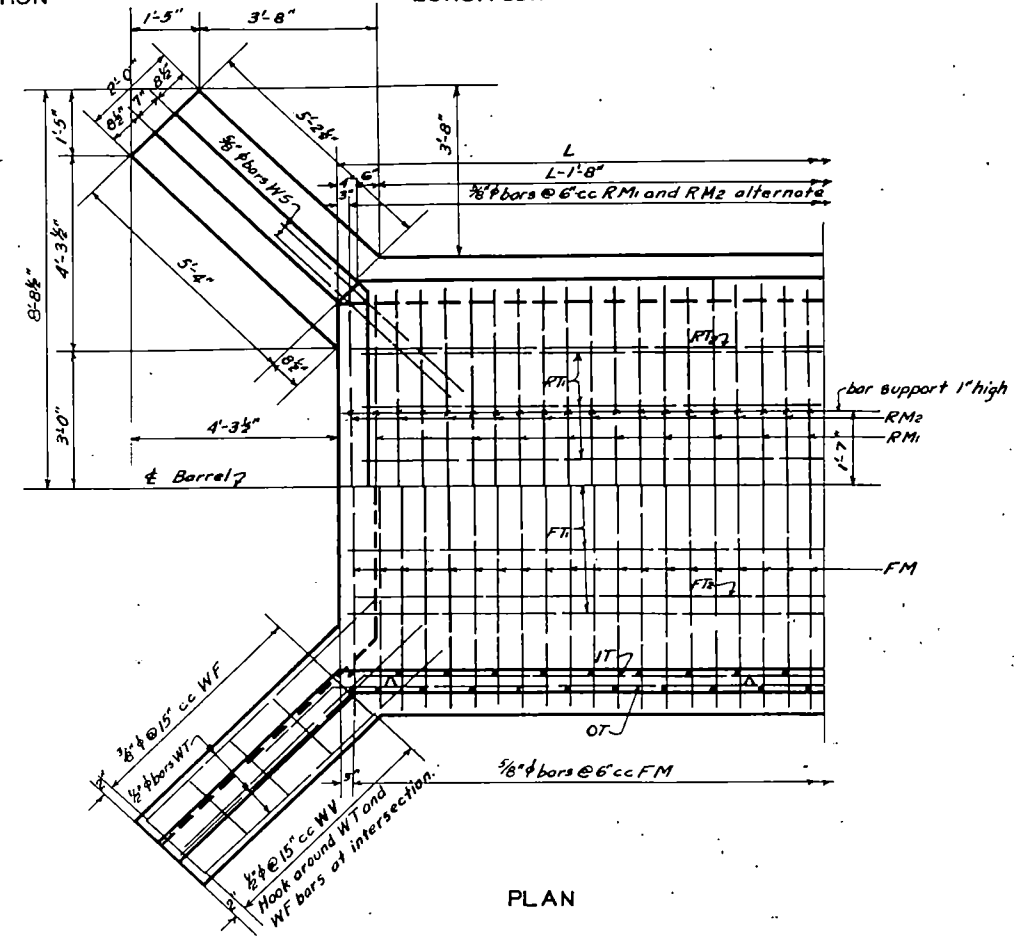
BAR LIST																							
L	28'	29'	30'	31'	32'	33'	34'	L															
Mark	No	Length	No	Length	No	Length	No	Length	No	Length	No	Length	No	Length	Mark	No	Length	No	Length	Mark			
FT1	5	3'-4"	5	3'-4"	5	3'-4"	5	3'-4"	5	3'-4"	5	3'-4"	5	3'-4"	FT2	5	37'-4"	5	37'-4"	FT2			
FT2	6	27'-9"	6	26'-9"	6	29'-9"	6	30'-9"	6	31'-9"	6	32'-9"	6	32'-9"	FM	57	9'-9"	6	33'-9"	FM			
FM	57	9'-9"	59	9'-9"	61	9'-9"	63	9'-9"	65	9'-9"	67	9'-9"	69	9'-9"	WT	12	7'-7"	72	7'-7"	WT			
WT	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	WF	20	5'-8"	20	5'-8"	WF			
WF	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	AH	2	18'-4"	2	18'-4"	AH			
AH	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	WV1	8	4'-3"	8	4'-3"	WV1			
WV1	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	WV2	8	5'-3"	8	5'-3"	WV2			
WV2	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	WV3	4	6'-4"	4	6'-4"	WV3			
WV3	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	OV	56	7'-9"	58	7'-9"	OV			
OV	56	7'-9"	58	7'-9"	60	7'-9"	62	7'-9"	64	7'-9"	66	7'-9"	68	7'-9"	IV	58	5'-9"	60	5'-9"	IV			
IV	58	5'-9"	60	5'-9"	62	5'-9"	64	5'-9"	66	5'-9"	68	5'-9"	70	5'-9"	IT1	4	38'-0"	4	38'-0"	IT1			
IT1	4	38'-0"	4	39'-0"	4	40'-0"	4	43'-0"	4	44'-0"	4	45'-0"	4	46'-0"	IT2	4	38'-0"	4	38'-0"	IT2			
IT2	4	38'-0"	4	39'-0"	4	40'-0"	4	43'-0"	4	44'-0"	4	45'-0"	4	46'-0"	OT	2	2'-2"	2	2'-2"	OT			
OT	2	2'-2"	2	3'-6"	2	3'-6"	2	3'-6"	2	3'-6"	2	3'-6"	2	3'-6"	RM	35	8'-9"	30	8'-9"	RM			
RM	35	8'-9"	29	8'-9"	30	8'-9"	31	8'-9"	32	8'-9"	33	8'-9"	34	8'-9"	RM1	35	8'-9"	36	8'-9"	RM1			
RM1	35	8'-9"	36	8'-9"	37	8'-9"	38	8'-9"	39	8'-9"	40	8'-9"	41	8'-9"	RT1	6	29'-10"	6	30'-10"	RT1			
RT1	6	29'-10"	6	30'-10"	6	31'-10"	6	32'-10"	6	33'-10"	6	34'-10"	6	35'-10"	RT2	2	27'-9"	2	28'-9"	RT2			
RT2	2	27'-9"	2	28'-9"	2	29'-9"	2	30'-9"	2	31'-9"	2	32'-9"	2	33'-9"	P	2	8'-8"	2	8'-8"	P			
P	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	WS	8	5'-0"	8	5'-0"	WS			
WS	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	L	33'	36'	37'	38'	39'	40'	41'	L
L	33'	36'	37'	38'	39'	40'	41'	L															
FT1	5	38'-4"	5	39'-4"	5	42'-4"	5	43'-4"	5	44'-4"	5	45'-4"	5	46'-4"	FT2	5	38'-4"	5	39'-4"	FT2			
FT2	6	34'-9"	6	35'-9"	6	36'-9"	6	37'-9"	6	38'-9"	6	39'-9"	6	42'-9"	FM	71	9'-9"	73	9'-9"	FM			
FM	71	9'-9"	73	9'-9"	75	9'-9"	77	9'-9"	79	9'-9"	81	9'-9"	83	9'-9"	WT	12	7'-7"	12	7'-7"	WT			
WT	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	12	7'-7"	WF	20	5'-8"	20	5'-8"	WF			
WF	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	20	5'-8"	AH	2	18'-4"	2	18'-4"	AH			
AH	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	2	18'-4"	WV1	8	4'-3"	8	4'-3"	WV1			
WV1	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	8	4'-3"	WV2	8	5'-3"	8	5'-3"	WV2			
WV2	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	8	5'-3"	WV3	4	6'-4"	4	6'-4"	WV3			
WV3	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	4	6'-4"	OV	70	7'-9"	72	7'-9"	OV			
OV	70	7'-9"	72	7'-9"	74	7'-9"	76	7'-9"	78	7'-9"	80	7'-9"	82	7'-9"	IV	72	5'-9"	74	5'-9"	IV			
IV	72	5'-9"	74	5'-9"	76	5'-9"	78	5'-9"	80	5'-9"	82	5'-9"	84	5'-9"	IT1	4	47'-0"	4	48'-0"	IT1			
IT1	4	47'-0"	4	48'-0"	4	49'-0"	4	50'-0"	4	51'-0"	4	52'-0"	4	53'-0"	IT2	2	42'-6"	2	43'-6"	IT2			
IT2	2	42'-6"	2	43'-6"	2	44'-6"	2	45'-6"	2	46'-6"	2	47'-6"	2	48'-6"	OT	8	39'-2"	8	42'-2"	OT			
OT	8	39'-2"	8	42'-2"	8	43'-2"	8	44'-2"	8	45'-2"	8	46'-2"	8	47'-2"	RM1	35	8'-9"	36	8'-9"	RM1			
RM1	35	8'-9"	36	8'-9"	37	8'-9"	38	8'-9"	39	8'-9"	40	8'-9"	41	8'-9"	RM2	35	13'-2"	37	13'-2"	RM2			
RM2	35	13'-2"	37	13'-2"	38	13'-2"	39	13'-2"	40	13'-2"	41	13'-2"	42	13'-2"	RT1	6	36'-10"	6	37'-10"	RT1			
RT1	6	36'-10"	6	37'-10"	6	38'-10"	6	39'-10"	6	40'-10"	6	41'-10"	6	42'-10"	RT2	2	34'-9"	2	35'-9"	RT2			
RT2	2	34'-9"	2	35'-9"	2	36'-9"	2	37'-9"	2	38'-9"	2	39'-9"	2	42'-9"	P	2	8'-8"	2	8'-8"	P			
P	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	2	8'-8"	WS	8	5'-0"	8	5'-0"	WS			
WS	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"	8	5'-0"									



BAR DETAILS



STRAIGHT BARS



PLAN

Designed for a MAXIMUM FILL of 3 FT.

QUANTITIES FOR ONE CULVERT					
L	Concrete	Rein. Steel	L	Concrete	Rein. Steel
Feet	Cu. Yds.	Lbs.	Feet	Cu. Yds.	Lbs.
28'	23.19	2863	38'	29.76	3779
29'	23.84	2951	39'	30.48	3876
30'	24.50	3040	40'	31.07	3963
31'	25.16	3136	41'	31.73	4065
32'	25.82	3222			
33'	26.47	3312			
34'	27.13	3404			
35'	27.79	3492			
36'	28.44	3593			
37'	29.10	3690			

NORTH DAKOTA
STATE HIGHWAY DEPARTMENT

STANDARD
REINFORCED CONCRETE
BOX CULVERT

CLEARSPAN: 8 FT. CLEARHEIGHT: 4 FT.

APPROVED 8-25 1927
APPROVED Sept 1 1927

Series of 1927.