FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	US-S-0720(3) UNIT 3	1960	6	79
		BU-072-1(2) UNIT 4	1960	6	118

END OF PROJ. NO. S-0720(1)
BEG. OF PROJECT No. US-S-0720(3) UNIT 3 STA. 346+50
ROADWAY RELOCATION H.O.D. FORT SHAFTER SEE SHEET 39
HAWAIIAN ORDNANCE DEPOT FORT SHAFTER
TRUE NORTH Scale: 1"=50'
M-1 ℄ CURVE DATA Δ= 5°55'39" R= 3000.00 T= 155.40 Lc= 305.59
'M-1' ℄ CURVE DATA Δ= 41°27'20" R= 1720.00 T= 650.89 Lc=1244.48
ROADWAY RELOCATION H.O.D. FORT SHAFTER SEE SHT 39
URBAN BOUNDARY
8'x4' Drainage Channel
New R/W Boundary
CB#1 Inv.= 13.06
CB#3 Inv.= 27.06
CB#9 Inv.= 30.06
CB#10 Inv.= 41.25
CB#10-A Inv.= 46.00
CB#13 Inv.= 49.51
CB#14 Inv.= 51.25
36" RCCP (Class III)
M-1 Station Line
RAMP "M-1"
Lt. Edge
END OF PROJ. NO. US-S-0720(3) Sta. 359+49.05 UNIT 3
BEG. OF PROJ. NO. BU-072-1(2) Sta. 7+80 UNIT 4
SDMH#1A Inv.= 7.06
CB#4A Inv.= 8.05
Outlet Inv.= 12.50
Exist. Chain Link Fence
Exist. tile wall Inv. 7.43
4'x3' Conc. Box Culv't
CB#5A Inv.= 8.00
24" RCCP (Class IV)
Inv. 7.73
P.C.C. Pavement
Existing underground Utility Vault (to be removed)
Conc. Ditch
345
350
355
CB#2 Inv.= 5.26
SDMH#1 Inv.= 5.00
CB#6 Inv.= 6.79
Freeway
℄ Median
48" RCCP (Class III)
WEST BOUND
EAST BOUND
SDMH#3 Inv.= 5.00
CB#3 Inv.= 5.17
CB#7 Inv.= 6.39
CB#11 Inv.= 7.00
CB#12 Inv.= 7.00
P.T. Sta. 19+32.30 See Sht. 5 of 9
STRUCTURE "A"
SDMH#5 Inv.= 7.00
℄ Mon.
STRUCTURE "B"
KING ST. ℄ CURVE DATA Δ= 3°20'30" R= 2550.00 T= 101.46 Lc= 202.79
BM #12 "+" Cut in F.H. 2196 El. 32.32
MIDDLE STREET
Middle St. Sta. 20+11.61
M-1 Sta. 21+34.13
FW Sta. 8+07.83 Middle St. Sta. 18+66.34
Middle St. Sta. 17+46.80 King St. Sta. 14+27.11
STRUCTURE "E"
P.C. Sta. 16+39.85
CB#17
SDMH#6
R/W
M.L.
Demolish Exist. Conc. Box Culv't (Incidental to Roadway Exc.)
Existing CB Inv.= 2.89
Existing 5'x4' Box Culv't
Type "EG" Curb & Gutter
Type A Curb
4'x4' Conc. Box Culv't
R/W Line
B.M.#9 F.H. #2201 Elev. 16.29
Beg. King St. ℄ P.O.C. Sta. 0+63.51
℄ P.T. Sta. 345+86.55
Beg. King St. ℄ P.C.C. Sta. 0+00 R=1606.85
R=1606.85 P.T. Sta. 4+17.64 SMH
T 1500
T 1503
T 1504
Existing Dirt Road
Existing Open Ditch
560'R
24" RCCP (Cl. III)
Inv. 4.08
CB#4 Inv.= 22.50
Type "AG" Curb & Gutter
Salvage existing lava rock curb
Station Line
221°36'00"
KING STREET
Left Edge
New R/W Boundary
SDMH#2 Inv.= 28.00
CB#8 Inv.= 36.50
T1562
T1563
B.M.#10 F.H. #2200 Elev. 28.94
See Sht. 5 of 9
SIGNAL CORPS AREA FORT SHAFTER

REFERENCE DRAWINGS

TYPICAL SECTIONS
DETAIL PLAN OF ROADWAY
ROADWAY DETAILS
DRAINAGE DETAILS
CONSTRUCTION PHASES

NOTE: All Existing Lava Rock Curbs to be removed shall be salvaged and stockpiled where and as directed by the Engineer and shall be paid for under the item "Salvaging Existing Lava Rock Curbs."

NOTE:
Coordinates referred to Mokauea Δ
Origin of Azimuth - Mokauea Δ
BM's referred to Mean Sea Level Datum

Ⓚ KING STREET ℄ CURVE DATA
Δ= 20°03'00"
R= 800.00
T= 141.42
Lc= 279.95

NOTE:
Refer to various Detail Plans and to Profiles of King St. and Ramp "M-1".

Profile of Existing Ground at Base Line (Referred to Eastbound Lanes)
WESTBOUND LANES
WESTBOUND LANES
230' V.C.
B.V.C. Sta. 352+00
E.V.C. Sta. 354+30
11.01
11.34
-0.478%
+0.7424%
Left Profile
Left Edge
Inv. 48" Conc. Pipe 0.40%
SDMH #1 Inv.= 5.00
SDMH #3 Inv.= 5.00
CB #12 Inv.= 7.00
SDMH #5 Inv.= 7.00
CB #17 Inv.= 8.00
10.41
EASTBOUND LANES
200' V.C.
B.V.C. Sta. 352+00
E.V.C. Sta. 354+00
11.01
11.03
Left & Right Profile
-0.478%
+0.500%
Rt. Profile
Rt. Edge
Sta. 353+00 C.G.
10.53
Sta. 346+50
13.64
B.V.C. Sta. 8+50.00
12.28
Sta. 357+47.08 Sta. 7+80
25
20
15
10
5
0
45
40
35
30
25
20
15
10
5
348
349
350
351
352
353
354
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356
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358
359
8
9

FREEWAY PROFILE

SHEET No. 1 OF 9 SHEETS

8

$526.6 $174.6

PLATE 1-PLAN-PROFILE O. P. R. & R. E. STANDARD
KEUFFEL & ESSER CO., NEW YORK.
K & E Co. No. 346-IC
"IMPERIAL" TRACING CLOTH 47633

00-I-8

ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	US-S-0720(3) UNIT 3	1960	6	79
		BU-072-1(2) UNIT 4	1960	6	118

ROADWAY RELOCATION
H.O.D. FORT SHAFTER
SEE SHEET 39
HAWAIIAN ORDNANCE DEPOT
FORT SHAFTER
TRUE NORTH
Scale 1:50
URBAN BOUNDARY Sta. 351+88.82
END OF PROJ. NO. S-0720(1)
BEG. OF PROJECT No. US-S-0720(3) UNIT 3 STA. 346+50
"M-1" ℄ CURVE DATA
Δ= 41°27'20"
R= 1720.00
T= 650.89
Lc=1244.48
ROADWAY RELOCATION
H.O.D. FORT SHAFTER
SEE SHT 39
CB#10-A Inv. 46.00
CB#9 Inv.= 39.06
36" RCCP (Class III)
M-1 Station Line
CB#10 Inv.= 41.23
RAMP "M-1"
Lt. Edge
CB#13 Inv.= 49.51
24" RCCP (Class IV)
CB#14 Inv.= 51.25
R/W
MIDDLE STREET (See Sht. 5 of 5)
Middle St. Sta. 20+11.61
M-1 Sta. 21+54.13
SDMH#4
C/C Mon. Sta. 20+00
Sta. 9+00.00
5'x4' Drainage Channel
New R/W Boundary
R/W Line
CB#1 Inv.= 5.06
CB#5 Inv.= 27.06
CB#4A
Cleanout Sta. 351+15
Cleanout Sta. 351+10
12" CMP 16 ga. Line "C"
10" CMP 16 ga. Line "D"
10" CMP 16 ga. Line "B"
10" CMP 16 ga. Line "A"
10" CMP 16 ga. Line "J"
10" CMP 16 ga. Line "K"
12" CMP 16 ga. Line "L"
10" CMP 16 ga. Line "M"
6" Perforated CMP
6" Perforated Drain Pipe Line "X"
Existing underground Utility Vault (to be removed)
R.C.C. Pavement
SDMH#1 Inv.= 5.00
SDMH#2 Inv.= 28.50
SDMH#3 Inv. 6.00
CB#2 Inv.= 5.29
CB#3 Inv.= 5.17
CB#4 Inv.= 22.50
CB#6 Inv. 6.57
CB#7 Inv. 6.57
CB#8 Inv.= 36.50
CB#11
CB#12
CB#17
CB#18
CB#34 Inv.= 9.80
Existing CB Inv.= 2.89
WEST BOUND
EAST BOUND
Freeway
Lt. Profile
Rt. Profile
Lt. Edge
Rt. Edge
84" RCCP (Cl. IV)
24" RCCP (Cl. III)
Existing 5'x4' Box Culv't
4'x4' Conc. Box Culv't
Demolish Exist. Conc. Box Culv't (Incidental to Roadway Exc.)
B.M.#7 F.H. #2201 Elev. 16.46
B.M.#10 F.H. #2200 Elev. 29.11
BM #12 "+" Cut in F.H. 2196 El. 32.32
Beg. King St. ℄ P.O.C. Sta. 0+63.51
T 1500
T 1503
T 1504
T 1523
T 1568
℄ PT. Sta. 345+86.55
Existing Dirt Road
Existing Open Ditch
Salvage existing lava rock curb
Station Line
221°38'00"
KING STREET
Left Edge
New R/W Boundary
KING STREET ℄ CURVE DATA
Δ= 20°03'00"
R= 674.00
T= 119.15
Lc= 235.86
KING ST. ℄ CURVE DATA
6" Perforated Subdrain Pipe adjacent to 48" drain pipe (Exact location to be determined by the Engineer)
Cleanout to be similar to that for CMP and shall be incidental to 6" Perforated Subdrain Pipe.
EQ
UNIT 3
END OF PROJ. No. US-S-0720(3) Sta. 359+49.08
BEG OF PROJ. No. BU-072-1(2) Sta. 7+50
UNIT 4
P.T. Sta. 19+32.30
STRUCTURE "A"
48" CMP 12 ga.
STRUCTURE "B"
STRUCTURE "E"
Line "E" 10" CMP 16 ga.
Line "F"
Line "G" 10" CMP 16 ga.
Line "H" 10" CMP 16 ga.
SDMH#5 Inv.= 7.50
Middle St. Sta. 18+68.34
F.W. Sta. 8+07.83
Middle St. Sta. 17+46.85
King St. Sta. 14+27.11
P.C. Sta. 16+55.83
M.L.
SIGNAL CORPS AREA
FORT SHAFTER
NOTE:
Refer to various Detail Plans and to Profiles of King St. and Ramp "M-1".
WESTBOUND LANES
250' V.C.
B.V.C. Sta. 352+00
E.V.C. Sta. 354+50
-0.476%
+0.7424%
Left Profile
Left Edge
Inv. 48" Conc. Pipe 0.40%
Inv. 48" Conc. Pipe 0.40%
EASTBOUND LANES
200' V.C.
B.V.C. Sta. 352+00
E.V.C. Sta. 354+00
-0.478%
+0.500%
Left & Right Profile
Profile of Existing Ground at Baseline (Aug. 21, 1962)
Rt. Edge
Rt. Profile
Sta. 359+49.08
Sta. 7+50
B.V.C. Sta. 8+50.00
348
349
350
351
352
353
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358
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9
FREEWAY PROFILE

REFERENCE DRAWINGS

- TYPICAL SECTIONS
- DETAIL PLAN OF ROADWAY
- ROADWAY DETAILS
- DRAINAGE DETAILS
- CONSTRUCTION PHASES

NOTE: All Existing Lava Rock Curbs to be removed shall be salvaged and stockpiled where and as directed by the Engineer and shall be paid for under the item "Salvaging Existing Lava Rock Curbs."

LEGEND

———	Corrugated Metal Pipe
———	6" Perforated Drain Pipe

See Sheet 2 for Details

NOTE:

Coordinates referred to Mokauea Δ
Origin of Azimuth - Mokauea Δ
BM's referred to Mean Sea Level Datum

Revised: April 15, 1963
Revised: Sept. 24, 1962

SUBDRAIN DETAIL

Sta. 346+50 to Sta. 14+00

SHEET 1 OF 2 SHEETS

8A

S526.6A S174.6A

PLAN-PROFILE D.P.R. & R.E. STANDARD
KEUFFEL & ESSER CO. NEW YORK
K&E Co. No. 348-1C

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-072-1(2) UNIT 4	1960	7	118
		BU-065-1(1) UNIT 3	1960	6	115

PLAN	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK ALIGNMENT CHECKED		
NO. RT. OF WAY CHECKED		

PROFILE	BY	DATE
SURVEYED		
PLOTTED		
NOTE BOOK GRADES CHECKED		
B. M.S NOTED		
NO. STRUCTURE NOTATIONS CHECKED		

MIDDLE STREET
SDMH#4 Inv.=43.90
Make Smooth Transition
HORNER STREET
LIMIT OF PROJECT No. BU-072-1(2) Sta. 9+40
CDI#1 Inv.=50.50
CB#19 Inv.=48.55
CB#16 Inv.=44.84
RAMP "M-1"
HORNER ST. Sta. 0+00 "M-1" Sta. 19+03.24
CB#22 Inv.=45.63
CB#23 Inv.=46.37
"M-1" Offset Line 1877.17 30"
"M-1" station Line
R/W and Control of Access Line
OLA LANE
LIMIT OF PROJECT No. BU-072-1(2)
CB#28 Inv.=47.24
CB#29 Inv.=47.40
CDI#3 Inv.=53.00
CB#31 Inv.=42.55
FREEWAY ℄ CURVE DATA
BM#9 "+" Cut in Maukarim S.M.H. El. 56.37
SDMH#15
SDMH#16
SDMH#18
CB#35 Inv.=36.56
RAMP "M-1"
RAMP "M-2"
WEST BOUND
EAST BOUND
SDMH#19 Inv.=36.50
New R/W and Control of Access Line
274°47'00"
SDMH#5 Inv.=40.00
RAMP "M-2"
"M-2" Station Line
128° 20' 40"
CB#17
CB#18
WEST BOUND
EAST BOUND
SDMH#9 Inv.=11.00
SDMH#10 Inv.=13.30
SDMH#11 Inv.=26.33
CB#25 Inv.=17.19
CB#26 Inv.=17.00
CB#30 Inv.=27.00
SDMH#14 Inv.=22.00
CB#32 Inv.=30.00
CB#33 Inv.=31.50
CB#36 Inv.=39.00
"M-2" Station Line
"M-3" Station Line
276°53'40"
RAMP "M-4"
"M-4" P.O.C. Sta. 2+72.20
"M-4" P.C. Sta. 2+66.49
M.L. ℄ Sta. 22+00
TRUE NORTH Scale: 1"=50'
STRUCTURE "C-D"
Drain Hand Hole
RAMP "M-3" 301° 53' 00"
CB#21 Inv.=13.72
CB#15 Inv.=15.75
SDMH#7 Inv.=17.03
Relocate Exist. Precast Curb
P.C.C. Pavement
OLA LANE OVERPASS
King St. Station Line
KING STREET 310° 28' 10"
END KING ST. Sta. 19+19.73
New R/W Boundary
Hawaii Chemical Co. buildings
OWEN ST.
Existing Grades to be used
Exist. C&C Mon.
CB#27
SDMH#12
BM#10 "+" Cut in 'Ewa' rim H.T. Co. M.H. El. 43.67
BM#11 "+" Cut on F.H. #2191 El. 46.94
Make Smooth Riding Connections
Existing Curb and Gutter to be used
BEG. OLA LANE LIMIT OF PROJECT No. BU-072-1(2)
KAM IV ROAD
Existing 30" Conc. Pipe
EXISTING KING ST. 310°37'40"
C&C Mon. Line
CB#34 Inv.=34.70
SDMH#17 Inv.=32.70
Existing Curb Line
℄ Main Driveway to Shopping Center
M.L.

NOTE: Refer to various Detail Plans and to Profiles of King St., Ola Lane, and to Ramps "M-1", "M-2, "M-3", "M-4".

FREEWAY ℄ CURVE DATA
Δ = 49° 53' 50"
R = 1400.00
T = 651.30
Lc = 1219.22

(4B) "M-4" CURVE DATA
Δ = 38° 00' 20"
R = 296.65
T = 102.16
Lc = 196.77

(4A) "M-4" ℄ CURVE DATA
Δ = 38° 00' 00"
R = 300.00
T = 103.31
Lc = 199.00

(1A) "M-1" ℄ CURVE DATA
Δ = 41° 27' 20"
R = 1720.00
T = 650.89
Lc = 1244.48

(O2) ℄ CURVE DATA OLA LANE
Δ = 73° 31' 46"
R = 64.00
T = 47.83
Lc = 82.13

(O1) ℄ CURVE DATA OLA LANE
Δ = 65° 56' 55"
R = 140.00
T = 90.83
Lc = 161.14

(H1) ℄ CURVE DATA HORNER ST.
Δ = 15° 32' 00"
R = 130.00
T = 17.73
Lc = 35.24

(2B) "M-2" ℄ CURVE DATA
Δ = 31° 33' 00"
R = 1186.00
T = 334.48
Lc = 651.97

(3C) "M-3" ℄ CURVE DATA
Δ = 11° 03' 20"
R = 1454.00
T = 140.72
Lc = 280.56

(3D) "M-3" ℄ CURVE DATA
Δ = 13° 48' 00"
R = 1038.28
T = 125.65
Lc = 250.08

ROBERT L. NORDLANDER REGISTERED PROFESSIONAL ENGINEER No. 895 HAWAII, U.S.A.

BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

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Profile of Existing Ground at Base Line
WESTBOUND LANES
300' V.C.
B.V.C. Sta. 10+00 16.91
E.V.C. Sta. 13+00 22.13
Lt. Profile
+0.7424 %
Lt. Edge
+2.74 %
CG Sta. 11+50 18.08
℄ Sta. 19+21.63 Right Edge 12' offset
Rt. Edge
Lt. Edge
400' V.C.
B.V.C. Sta. 8+50 14.28
E.V.C. Sta. 12+50.00 20.76
+0.300 %
Rt. Profile
Rt. Edge
+2.740 %
Rt. and Lt. Profile
Inv. 30" Conc. Pipe 1.00 %
Inv. 30" Conc. Pipe 2.07 %
Inv. 30" Conc. Pipe 2.50 %
Inv. 30" Conc. Pipe 2.85 %
Inv. 30" Con. Pipe 2.85 %
Inv. 24" Conc. Pipe 0.50 %
Inv. 24" Conc. Pipe 2.32 %
Inv. 24" Conc. Pipe 2.40 %
Inv. 24" Conc. Pipe 2.30 %
C.B.#17 Inv. 13.00
C.G.S. 10+50.00 15.28
SDMH#9 Inv. 11.00
CB#26 Inv. 17.00
SDMH#14 Inv. 22.00 Inv. 23.00
SDMH#14-A Inv. 26.58
CB#32 Inv. 30.00 Inv. 31.50
CB#33 Inv. 31.50
SDMH#19 Inv. 36.50
CB#37 Inv. 40.16 Inv. 41.01
8
9
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21

FREEWAY PROFILE

SHEET No. 2 OF 9 SHEETS

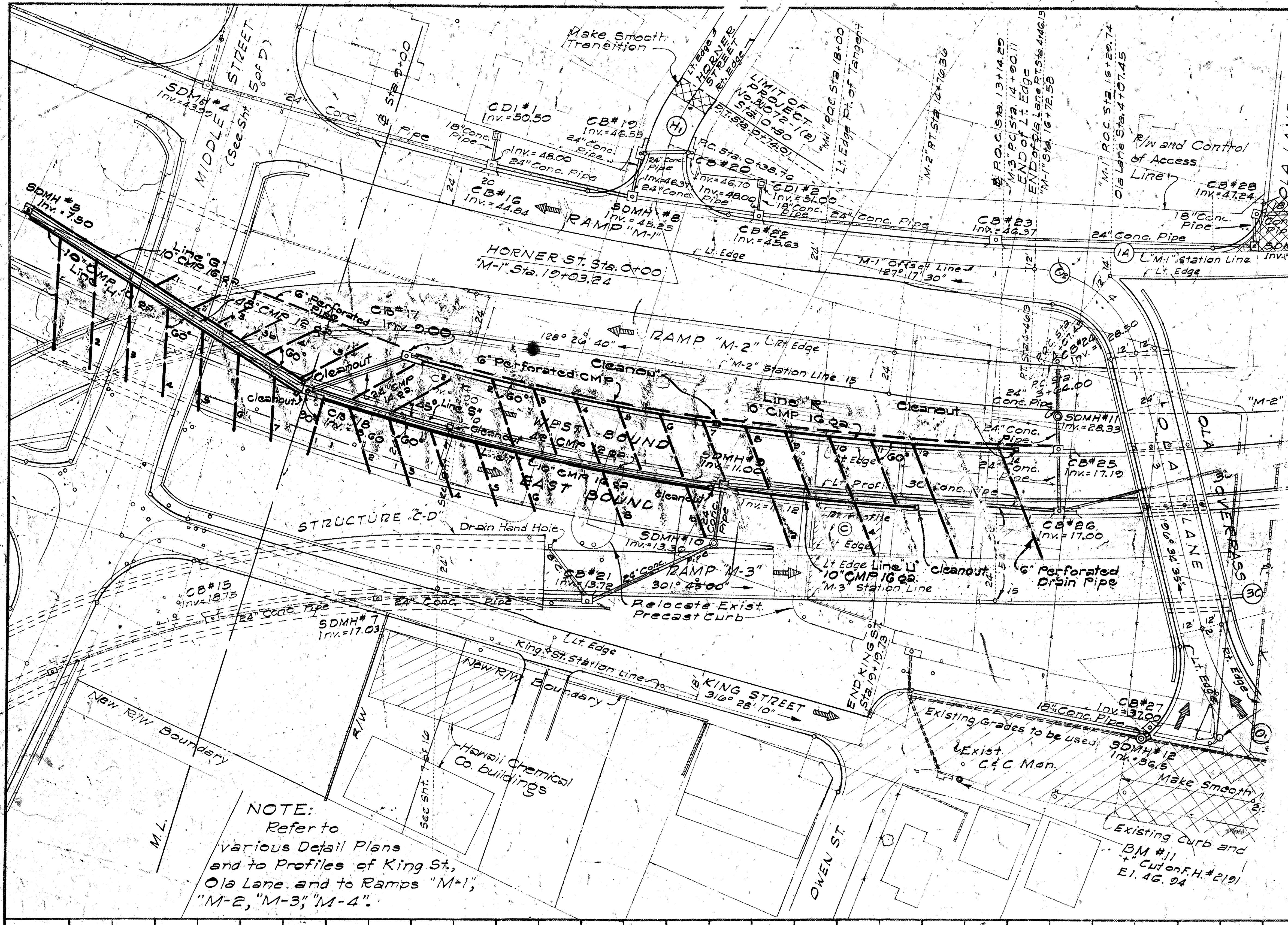
S174.7 S161.6

55

PLATE 1 - PLAN-PROFILE
KEUFFEL & ESSER CO. NEW YORK
K & E Co. No. 348-1C

DO-I-8

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-072-1(2) UNIT 4	1960	7	118
		BU-065-1(1) UNIT 3	1960	6	115

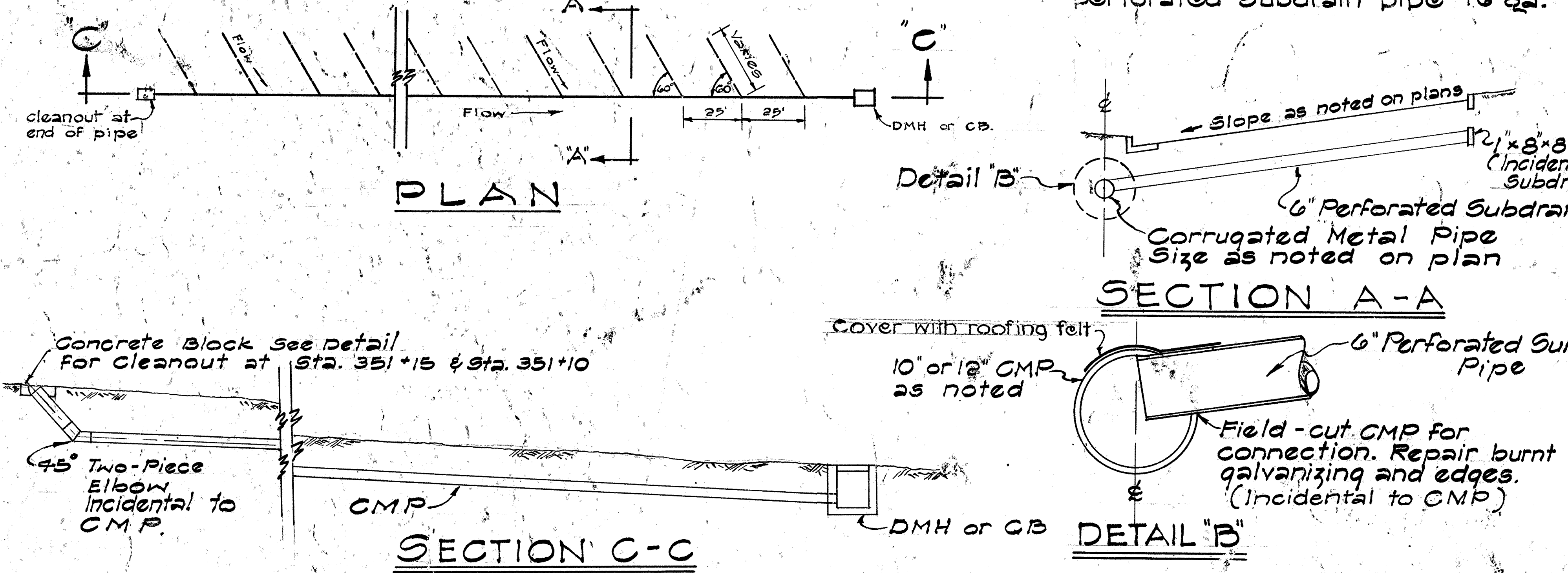


MIDDLE STREET (See Sht. 50 F 2)
SDMH #4 Inv.=45.50
SDMH #3 Inv.=1.90
Make Smooth Transition
CDI #1 Inv.=50.50
CB #19 Inv.=46.55
CB #16 Inv.=44.84
SDMH #8 Inv.=45.25
CB #22 Inv.=45.63
CB #23 Inv.=46.37
CB #28 Inv.=47.84
R/W and Control of Access Line
RAMP "M-1"
HORNER ST. Sta. 0+00 "M-1" Sta. 19+03.24
RAMP "M-2"
"M-2" Station Line
Line "G" 10" CMP 16 ga.
6" Perforated CMP
Cleanout
Line "R" 10" CMP 16 ga.
WEST BOUND
EAST BOUND
SDMH #9 Inv.=11.00
SDMH #11 Inv.=28.32
CB #25 Inv.=17.19
CB #26 Inv.=17.00
6" Perforated Drain Pipe
STRUCTURE "C-D"
Drain Hand Hole
SDMH #10 Inv.=13.30
RAMP "M-3" 301° 48' 00"
CB #21 Inv.=13.72
Lt. Edge Line "L" 10" CMP 16 ga.
"M-3" Station Line
Relocate Exist. Precast Curb
CB #15 Inv.=18.75
SDMH #7 Inv.=17.03
King St. Station Line
KING STREET 310° 28' 10"
New R/W Boundary
END KING ST. Sta. 19+00
CB #27 Inv.=31.00
SDMH #12 Inv.=36.5
Make Smooth
Existing Grades to be used
Exist. C & C Man.
Existing Curb and
BM #11 "+" Cut on F.H. #2191 El. 46.94
Hawaii Chemical Co. buildings
OWEN ST.
OLA LANE
M.L.

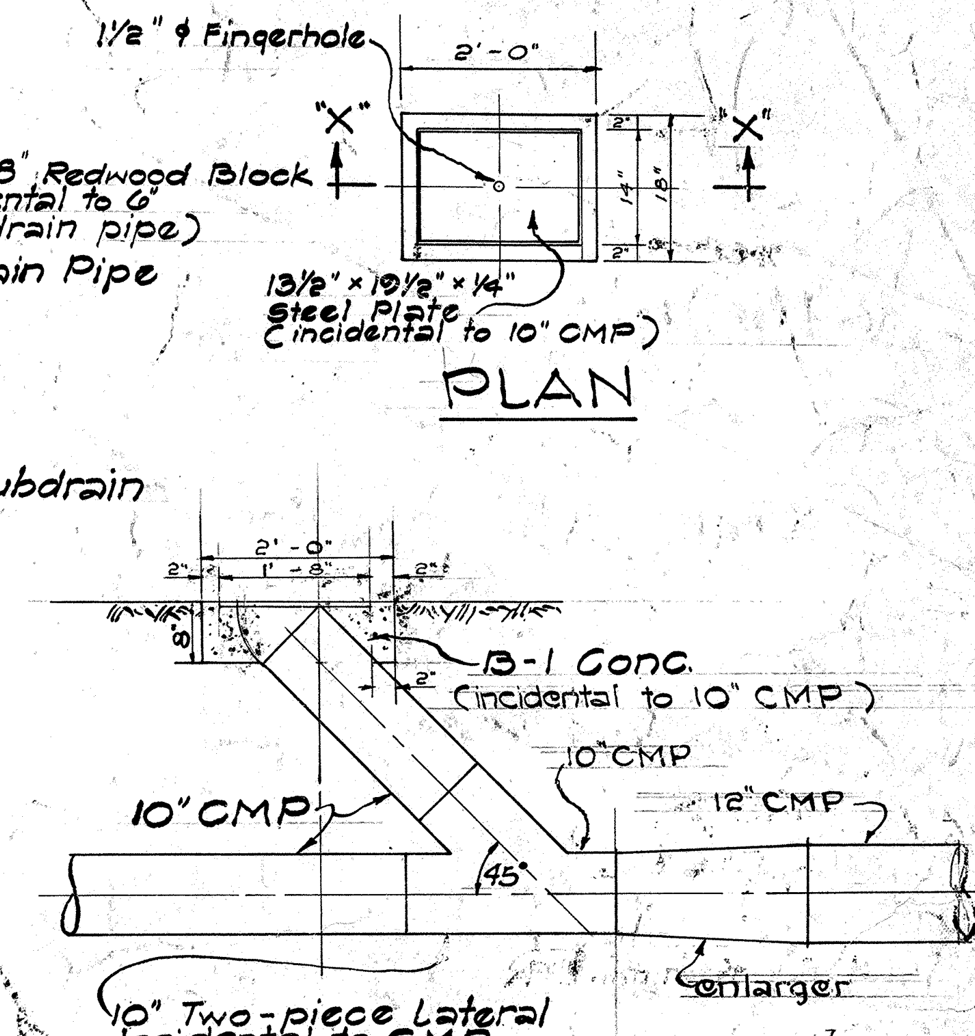
NOTE:
Refer to various Detail Plans and to Profiles of King St., Ola Lane, and to Ramps "M-1", "M-2", "M-3", "M-4".

SUBDRAIN DETAILS

NOTE:
1. Dimensions typical unless noted. Otherwise on plans.
2. All laterals shall be 6" CMP perforated Subdrain pipe 16 ga.



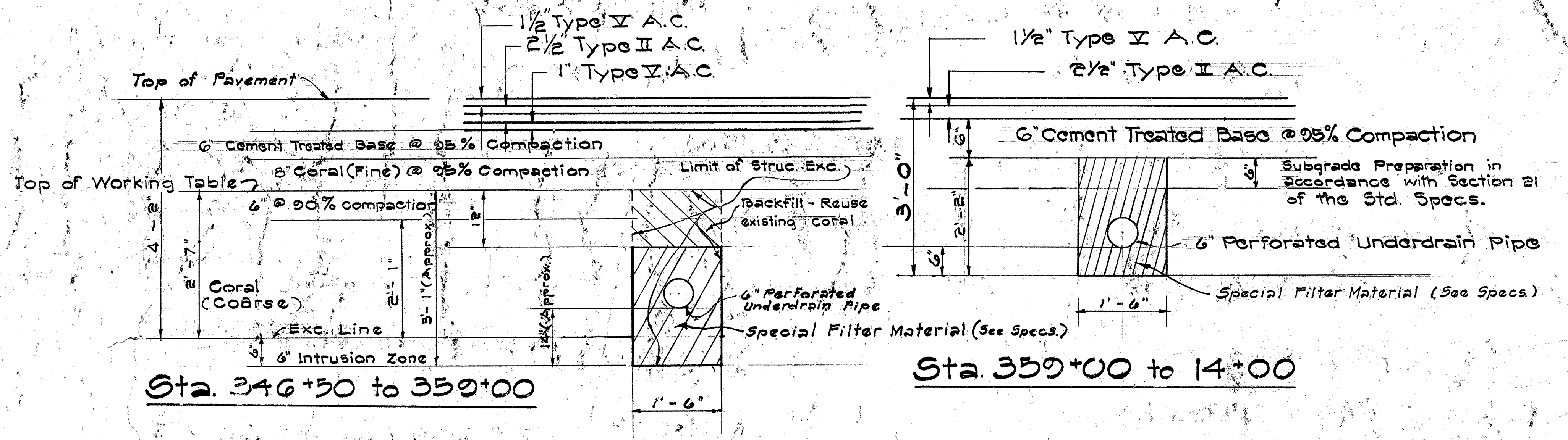
"C"
cleanout at end of pipe
Flow
"A"
Varies
60°
25'
25'
DMH or CB.
PLAN
Slope as noted on plans
1"×8"×8" Redwood Block (Incidental to 6" Subdrain pipe)
Detail "B"
6" Perforated Subdrain Pipe
Corrugated Metal Pipe Size as noted on plan
SECTION A-A
Concrete Block See Detail for Cleanout at Sta. 351+15 & Sta. 351+10
45° Two-Piece Elbow Incidental to CMP.
CMP
DMH or CB
SECTION C-C
Cover with roofing felt
10" or 12" CMP as noted
6" Perforated Subdrain Pipe
Field-cut CMP for connection. Repair burnt galvanizing and edges. (Incidental to CMP)
DETAIL "B"



1½" ø Fingerhole
2'-0"
"X"
13⅝" × 13⅝" × ¼" Steel Plate (Incidental to 10" CMP)
PLAN
B-1 Conc. (Incidental to 10" CMP)
10" CMP
12" CMP
45°
Enlarger
10" Two-piece Lateral Incidental to CMP

DETAIL of CLEANOUT and CONCRETE BLOCK at Sta. 351+15 & 351+10

SECTION "X-X"



1½" Type V A.C.
2½" Type II A.C.
1" Type V A.C.
Top of Pavement
6" Cement Treated Base @ 95% Compaction
8" Coral (Fine) @ 95% Compaction
Top of Working Table
6" @ 90% compaction
Limit of Struc. Exc.
Backfill - Reuse existing coral
4'-2"
2'-7"
2'-1"
3'-1" (Approx.)
12"
14" (Approx.)
Coral (Coarse)
Exc. Line
6" Intrusion Zone
6" Perforated Underdrain Pipe
Special Filter Material (See Specs.)
1'-6"
Sta. 346+50 to 359+00
1½" Type V A.C.
2½" Type II A.C.
6" Cement Treated Base @ 95% Compaction
Subgrade Preparation in accordance with Section 21 of the Std. Specs.
3'-0"
2'-2"
6"
6" Perforated Underdrain Pipe
Special Filter Material (See Specs.)
1'-6"
Sta. 359+00 to 14+00

TYPICAL SECTIONS

NOT TO SCALE

BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

Revised: April 15, 1963

Revised: Sept. 24, 1962

SUBDRAIN DETAIL
Sta. 346+50 to Sta. 14+00

SHEET No. 2 OF 2 SHEETS

S174.7A

S161.6

9A

PLAN
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
NOTE BOOK
NO.
BY
DATE

PROFILE
SURVEYED
PLOTTED
GRADES CHECKED
B. M.S NOTED
STRUCTURE NOTAT'NS CH'KD.
NOTE BOOK
NO.
BY
DATE

PLATE 1 - PLAN-PROFILE C. F. R. & R. E. STANDARD
KEUFFEL & ESSER CO., NEW YORK
K & E Co. No. 346-1C
IMPERIAL TRACING CLOTH 47633

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-065-1(1) UNIT 3	1960	7	115
		BU-072-1(2) UNIT 4	1960	8	118

NOTE: For Typical Section of RICHARD LANE, see sht. 26
For Typical Section of RICHARD LANE "A", see sht. 25

NOTE:
Refer To Detail Plans and
Other Profile sheets

TRUE NORTH
Scale: 1"=50'
BM #7
"+" Cut in Mauka rim SMH
El. 46.69
BM #8
Spike in pav't
@ Sta. 24+89±, 80' Rt.
El. 58.32
BM #6
"□" Cut on FH# 2182
El. 65.77
RAMP "M-2"
RAMP "M-4"
"M-1" Station Line
"M-2" Station Line
"M-4" Station Line
BEGIN RAMP "M-1"
BEGIN RAMP "M-2"
END RAMP "M-4"
New R/W and Control of Access Line
New R/W and Control of Access Line
New R/W Line
New R/W Boundary
Control of Access Line
Freeway Lt. Edge Offset (Not Radial)
RICHARD LANE "A"
WEST BOUND
EAST BOUND
KALIHI STREAM
KALIHI STREAM BRIDGE
FREEWAY Sta. 30+12.75 = RICHARD LANE Sta. 1+00
Freeway Sta. 36+07.17 = Gulick Ave. Sta. 5+89.66
Gulick Sta. 5+00.00 = Beckley Sta. 0+00
Existing Gulick Ave. and Beckley St. Spike
GULICK AVE. OVERPASS
GULICK
BECKLEY ST.
PINKHAM ST.
RICHARD LANE
AVENUE
STA. 32+00
END OF PROJ. No. BU-072-1(2) UNIT 4
PROJ. U-072-1(7) unit 3
CB #37
CB #38
CB #39
CB #40
SDMH #18
SDMH #20
SDMH #21 (Exist.)
CDI #4
CDI #5
24" Conc. Pipe
36" Conc. Pipe
30" Conc. Pipe
Profile of Existing Ground at Base Line
600' V.C.
400' V.C.
-1.200%
+2.74%
Rt. and Lt. Profile
Lt. Edge
Rt. Edge
Kalihi Stream Bridge
EXISTING OUTLET Inv.= 40.00
RICHARD LANE "A"
RICHARD LANE
℄ FREEWAY
Profile @ ℄
Existing Grd.@ ℄

(2A) "M-2" ℄ CURVE DATA
Δ = 9° 42' 34"
R = 1426.00
T = 121.12
Lc = 241.65

FREEWAY ℄ CURVE DATA
Δ = 38° 06' 20
R = 4000.00
T = 1381.43
Lc = 2660.27

Robert L. Nordlander
No. 895

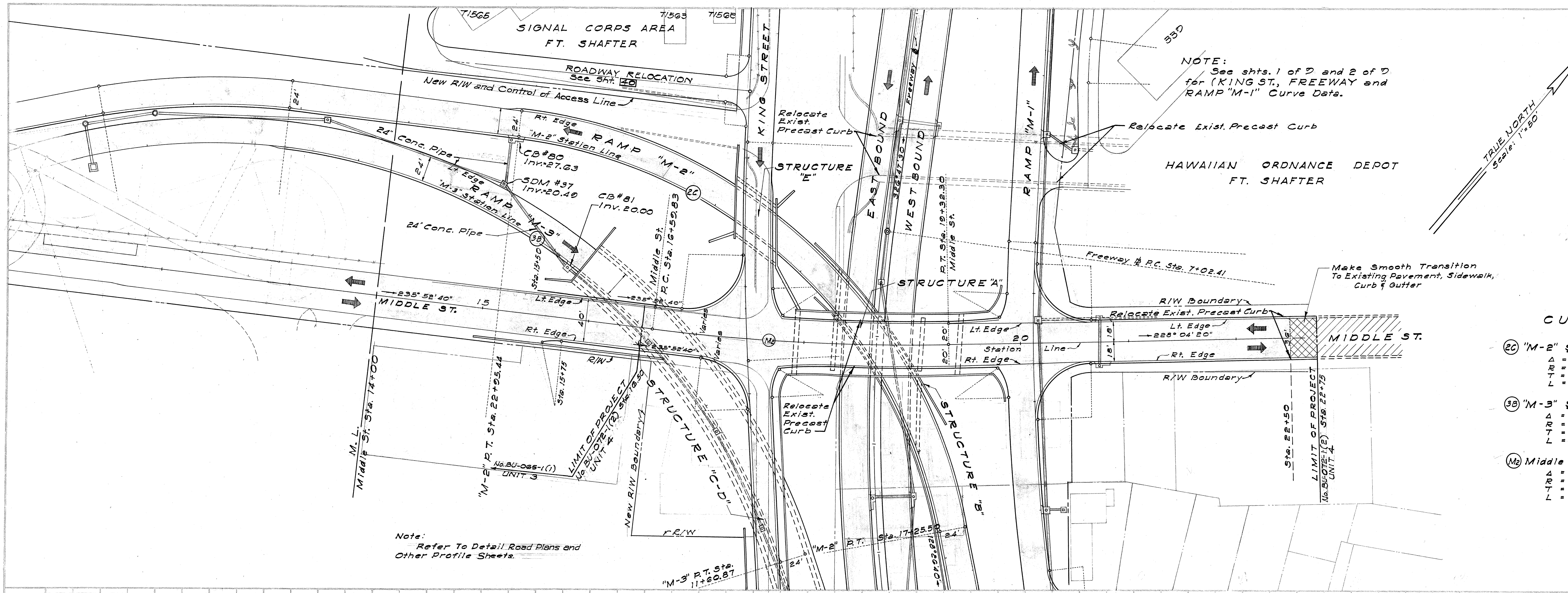
BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

SHEET No. 3 OF 9 SHEETS

S174.8 S161.7 10

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-065-1(1) UNIT 3	1960	9	115
		BU-072-1(2) UNIT 4	1960	9	118

PLAN
NOTE BOOK NO.
SURVEYED
PLOTTED
ALIGNMENT CHECKED
RT. OF WAY CHECKED
BY DATE


T1565
T1563
T1566
SIGNAL CORPS AREA
FT. SHAFTER
ROADWAY RELOCATION
See Sht. 40
New R/W and Control of Access Line
KING STREET
24'
Rt. Edge
"M-2" Station Line
RAMP "M-2"
24" Conc. Pipe
CB #80
Inv.=27.63
Lt. Edge
SDM #37
Inv.=20.49
RAMP "M-3"
"M-3" Station Line
CB #81
Inv. 20.00
24" Conc. Pipe
2C
3B
Sta. 15+50
Middle St. P.C. Sta. 16+59.83
235° 52' 40"
MIDDLE ST.
15
Lt. Edge
40'
Rt. Edge
R/W
Varies
M2
M. L. Middle St. Sta. 14+00
"M-2" P. T. Sta. 22+95.44
No. BU-065-1(1) UNIT 3
LIMIT OF PROJECT No. BU-072-1(2) Sta. 16.50 UNIT 4
Sta. 15+75
New R/W Boundary
STRUCTURE "C-D"
R/W
Note:
Refer To Detail Road Plans and Other Profile Sheets.
"M-3" P.T. Sta. 11+60.87
"M-2" P.T. Sta. 17+25.50
Relocate Exist. Precast Curb
STRUCTURE "E"
EAST BOUND
WEST BOUND
Freeway ℄
326° 47' 30"
P. T. Sta. 19+32.30 Middle St.
STRUCTURE "A"
STRUCTURE "B"
128° 26' 40"
RAMP "M-1"
53D
NOTE:
See shts. 1 of 9 and 2 of 9 for (KING ST., FREEWAY and RAMP "M-1" Curve Data.
Relocate Exist. Precast Curb
HAWAIIAN ORDNANCE DEPOT
FT. SHAFTER
TRUE NORTH
Scale: 1"=50'
Freeway ℄ P.C. Sta. 7+02.41
Make Smooth Transition To Existing Pavement, Sidewalk, Curb & Gutter
R/W Boundary
Relocate Exist. Precast Curb
Lt. Edge
228° 04' 20"
20
Station Line
Rt. Edge
20'
18'
36'
MIDDLE ST.
R/W Boundary
Sta. 22+50
LIMIT OF PROJECT No. BU-072-1(2) Sta. 22+75 UNIT 4

CURVE DATA

(2C) "M-2" ℄ Curve Data
Δ = 72° 34' 00"
R = 450.00
T = 330.36
L = 569.94

(3B) "M-3" ℄ Curve Data
Δ = 90° 52' 20"
R = 550.00
T = 558.44
L = 872.31

(M2) Middle St. ℄ Curve Data
Δ = 7° 48' 20"
R = 2000.00
T = 136.44
L = 272.47

ROBERT L. NORDLANDER
REGISTERED PROFESSIONAL ENGINEER
No. 895
HAWAII, U.S.A.

Robert L. Nordlander

BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

PROFILE
NOTE BOOK NO.
SURVEYED
PLOTTED
GRADES CHECKED
B. M.S NOTED
STRUCTURE NOTAT'NS CH'KD.
BY DATE

MIDDLE STREET PROFILE

MIDDLE STREET INTERCHANGE

SHEET No. 5 OF 9 SHEETS

PLATE 1—PLAN-PROFILE C. P. R. & R. E. STANDARD
KEUFFEL & ESSER CO. NEW YORK
K & E Co. No. 246-1C

DD-T-X

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	US-S-0720(3) UNIT 3	1960	7	79
		BU-072-1(2) UNIT 4	1960	10	118

FINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		
NOTE BOOK NO		

ORIGINAL SURVEY	BY	DATE
SURVEYED		
PLOTTED		
TEMPLATE		
AREAS		
AREAS CHECKED		
NOTE BOOK NO		

BEGIN RAMP "M-1" Station Line Sta. 6+83.08
Ramp "M-2" Sta. 13+73.22 Rt. Edge
53.12
Join to Ramp "M-2" Station Line
Join to Ramp "M-2" Rt. Edge
BEGIN "M-1" Lt. Edge Sta. 8+97.92
Ramp "M-2" Sta. 15+83.54 Rt. Edge
46.54
-3.612%
B.V.C. Sta. 9+50.00
44.45
400' V.C.
Existing Ground Profile
Lt. Edge
Inv. 24" 0.50%
Conc. Pipe
C.G. Sta. 11+50.00
37.23
CB #35 Inv. = 36.56
SDMH #5 Inv. = 36.08 Inv. = 37.50
Inv. 24" Conc. Pipe 3.30%
E.V.C. Sta. 13+50.00
48.81
Inv. = 42.55 CB #31
+5.790%
C.G. Sta. 15+00.00
57.50
B.V.C. Sta. 14+00.00
51.71
200' V.C.
E.V.C. Sta. 16+00.00
Lt. Edge
-1.000%
12' % Left
SDMH #13 Inv. = 47.14
Inv. 24" Conc. Pipe 0.50%
55.50
55.65
"M-1" Sta. 16+29.74 Lt. Edge
"Ole Lane" Sta. 10+07.43 Rt. Edge
"M-1" Sta. 16+72.58 = Ole Lane Sta. 4+64.13 Lt. Edge
CB #23 Inv. = 46.37 Inv. = 46.37
Inv. 24" Conc. Pipe 0.53%
B.V.C. Sta. 17+75.00
54.75
200' V.C.
E.V.C. Sta. 19+75.00
55.25
+1.500%
Station Line
Sta. 18+75.00 C.G.
53.75
CB #22 Inv. = 45.63 Inv. = 45.63
SDMH #8 Inv. = 45.25 Inv. = 45.25
Inv. 24" Conc. Pipe 0.50%
CB #16 Inv. = 44.84 Inv. = 44.84
See Middle St. Intersection Ramp "M-1" Profile Detail
C.G. Sta. 22+50.00
59.37
+1.500%
B.V.C. Sta. 20+50.00
Existing Ground Profile
Lt. Edge
Inv. 24" Conc. Pipe 0.50%
Inv. 36" Conc. Pipe 1.66%
Inv. 36" Conc. Pipe 1.74%
CB #16 Inv. = 44.84 Inv. = 44.84
SDMH #4 Inv. = 43.99 Inv. = 43.99
56.37
CB #10 Inv. 41.23
400' V.C.
47.37
E.V.C. Sta. 24+50.00
Inv. = 39.06 Inv. = 39.06
CB #9
Station Line
-6.000%
Inv. 36" Conc. Pipe 6.00%
CB #5 Inv. = 27.06 Inv. = 27.06
Inv. 36" Conc. Pipe 6.00%
B.V.C. Sta. 27+75.00
37.87
650' V.C.
13.47
CB #1 Inv. = 15.06 Inv. = 15.06
Inv. 36" Conc. Pipe 6.6%
SDMH #1A
8.37
Inv. 36" Conc. Pipe 0.55%
+1.5678%
CB #4A
Inv. 5x3' Conc. Box Culvert 0.3%
Exist. Box Culvert
E.V.C. Sta. 34+25.00
Sta. 34+92.72 END OF RAMP M-1
14.53
Existing Pavement
+1.6%
Lt. Edge
C.G.
Sta. 22+50.00
+1.50%
56.79
56.79
Middle Street
"M-1" Sta. 21+34.13 = Middle St. Sta. 20+11.37
"M-1" Sta. 21+54.13 = Middle St. Sta. 20+11.60
"M-1" Sta. 21+74.14 = Middle St. Sta. 20+12.07
56.92
(Sub) C.G. "M-1" Sta. 20+90.00
56.97
Base Grade Profile at Station Line
-0.408%
0.13 Parabolic Crown
+1.50%
Lt. Edge
Base Grade Profile at Station Line
B.V.C. Sta. 20+50.00
56.37
80' V.C.
(Sub) E.V.C. Sta. 21+30.00
56.81
20+50
21+00
21+50
22+00
22+50
6
7
8
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58
59

RAMP "M-1" PROFILE

MIDDLE STREET INTERSECTION RAMP "M-1" PROFILE DETAIL

RAMP "M-1" PROFILE

MIDDLE STREET INTERCHANGE

SHEET No. 6 OF 9 SHEETS

S526.7 S174.10

FED. ROAD DIST. No	STATE	FED. AID PROJ. No	FISCAL YEAR	SHEET No	TOTAL SHEET
HAWAII	HAW	US-S-0720(3) UNIT 3	1960	8	79
		BU-072-1(2) UNIT 4	1960	11	118
		BU-065-1(1) UNIT 3	1960	11	115

FINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK
NO.
BY
DATE

ORIGINAL SURVEY
SURVEYED
PLOTTED
TEMPLATE
AREAS
AREAS CHECKED
NOTE BOOK
NO.
BY
DATE

FUTURE CONSTRUCTION
BEG. "M-3"
C.G. Sta. 3+50.00
29.17
Existing Ground Profile
Lt. Edge
Station Line
+1.000%
-0.500%
Join To Existing Pavement
Transition Area
Sta. 0+75.00
Sta. 1+00.00
B.V.C. Sta. 2+00.00
26.32
26.77
27.17
27.52
27.82
28.07
28.27
28.42
28.52
28.57
28.57
28.52
Inv. 24" Conc. Pipe 0.72%
300' V.C.
CB #79 Inv. 23.60
SDMH #35 Inv. 22.18 Inv. 22.18
E.V.C. Sta. 5+00.00
28.42
SDMH #36 Inv. 21.38 Inv. 21.38
B.V.C. Sta. 6+50.00
27.67
27.52
27.34
27.12
26.86
26.57
26.23
25.86
C.G. Sta. 7+50.00
27.17
SDMH #37 Inv. 20.40 Inv. 20.40
200' V.C.
CB #81 Inv. 20.00 Inv. 20.00
E.V.C. Sta. 8+50.00
25.45
SDMH #6 Inv. 19.47 Inv. 19.47
CB #15 Inv.=18.75 Inv.=18.75
-1.721%
Inv. 24" Conc. Pipe 1.72%
SDMH #7 Inv.=17.03 Inv.=17.03
Inv. 24" Conc. Pipe 2.65%
CB #21 Inv.=13.72 Inv.=13.72
0 1 2 3 4 5 6 7 8 9 10 11 12
15 20 25 30
RAMP "M-3" PROFILE
Lt. Edge
-1.721%
B.V.C. Sta. 11+50.00
20.28
300' V.C.
19.91
19.66
19.53
19.52
19.63
19.86
20.21
20.68
21.26
21.97
22.80
Inv. 24" Conc. Pipe 2.65%
Inv. 24" Conc. Pipe 0.50%
Sta. 13+00.00
17.70
C.G.
CB #21 Inv.=13.72 Inv.=13.72
SDMH #10 Inv.=13.30 Inv.=13.30
-4.030%
100' V.C.
P.R.V.C. Sta. 14+50.00
23.75
24.71
C.G. Sta. 15+00.00
25.30
25.76
26.38
E.V.C. Sta. 15+50.00
27.08
Join to Freeway Rt. Edge
Ramp "M-3" Sta. 14+90.11 Lt. Edge
Freeway ℄ Sta. 13+14.29 Rt. Edge
23.96
Station Line
+2.638%
Sta. 17+70.67
32.90
33.01
33.67
34.31
34.93
35.55
36.17
36.77
37.36
37.94
38.48
38.91
39.35
39.84
40.35
Ramp "M-3" Sta. 21+19.91
Freeway ℄ Sta. 19+21.60
40.77
Join to Freeway Rt. Edge
NOTE:
Profile of Ramp "M-3" Station Line between Sta. 17+70.67 to Sta. 21+19.91 developed from Profile of Freeway ℄
11 12 13 14 15 16 17 18 19 20 21 22
15 20 25 30
RAMP "M-3" PROFILE
40 35 30 25
20 15 10 5
Sta. 0+63.51
11.38
Existing Ground Profile
-0.2793%
B.V.C. Sta. 1+90
11.03
300' V.C.
11.01
11.05
11.23
11.53
11.96
12.52
12.92
13.21
14.03
14.97
16.04
17.24
C.G. Sta. 3+40
10.61
0 1 2 3 4
KING STREET PROFILE
E.V.C. Sta. 4+20
19.44
300' V.C.
+5.886%
17.24
18.58
20.03
22.77
25.71
CB #4 Inv.=22.50
B.V.C. Sta. 7+25.00
33.80
Inv. 24" Conc. Pipe 5.67%
34.70
36.07
37.37
38.60
39.75
40.83
41.88
SDMH #2 Inv.=28.90 Inv.=28.90
Inv. 24" Conc. Pipe 5.06%
C.G. Sta. 8+25.00
30.16
200' V.C.
E.V.C. Sta. 9+25.00
48.78
Inv.=36.50 CB #3
Station Line
B.V.C. Sta. 11+00.00
49.02
50.02
50.91
51.69
52.37
52.94
53.41
53.77
54.02
54.17
54.21
54.14
53.97
53.69
53.31
52.82
400' V.C.
C.G. Sta. 13+17.00
56.07
Sta. 13+50.00
Lt. Edge
King St. Sta. 14+47.11
Middle St. 17+46.89
Sta. 14+75.00
NOTE:
See Detail Plan for Lt. Edge Profile between Sta. 13+50.00 to Sta. 14+75.00
E.V.C. Sta. 15+00.00
52.22
-2.600%
Existing Ground Profile
B.V.C. Sta. 16+75.00
47.67
150' V.C.
47.06
46.55
46.11
45.77
45.51
C.G. Sta. 17+50.00
45.72
E.V.C. Sta. 18+25.00
45.35
END King St. 19+19.73
-0.500%
Join to Existing Pavement
5 6 7 8 9 10 11 12 13 14 15 16 17
20 25 30 35 40 45 50 55
KING STREET PROFILE

MIDDLE STREET INTERCHANGE

THIS SHEET SUPERCEDES SHEET #15

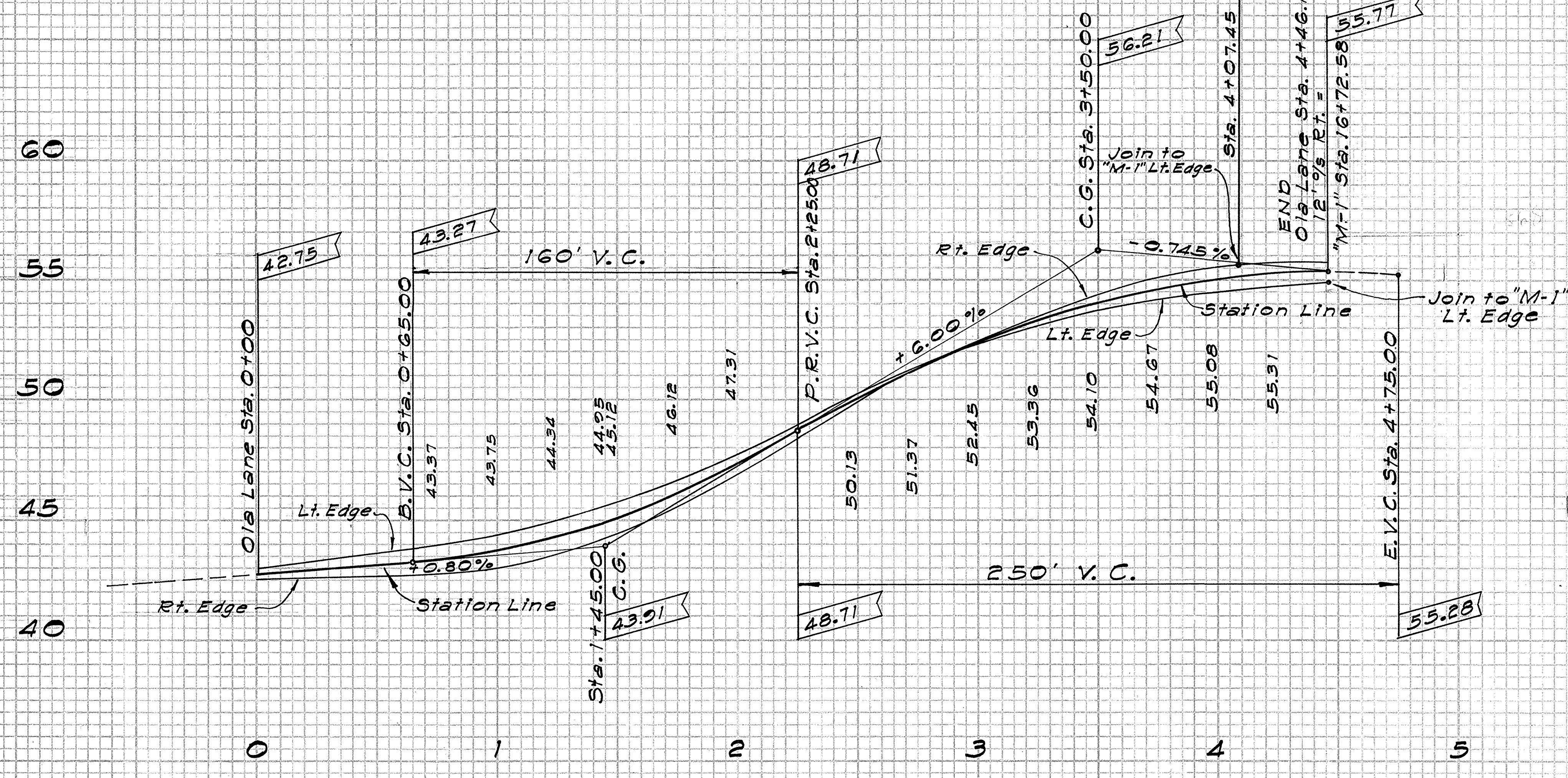
SHEET No. 8 OF 9 SHEETS

S526.S S174.11 S161.11 15A

PLATE 3 - CROSS SECTION ... STANDARD
KEUFFEL & ESSER CO. NEW YORK
K & E Co. No. 346-30

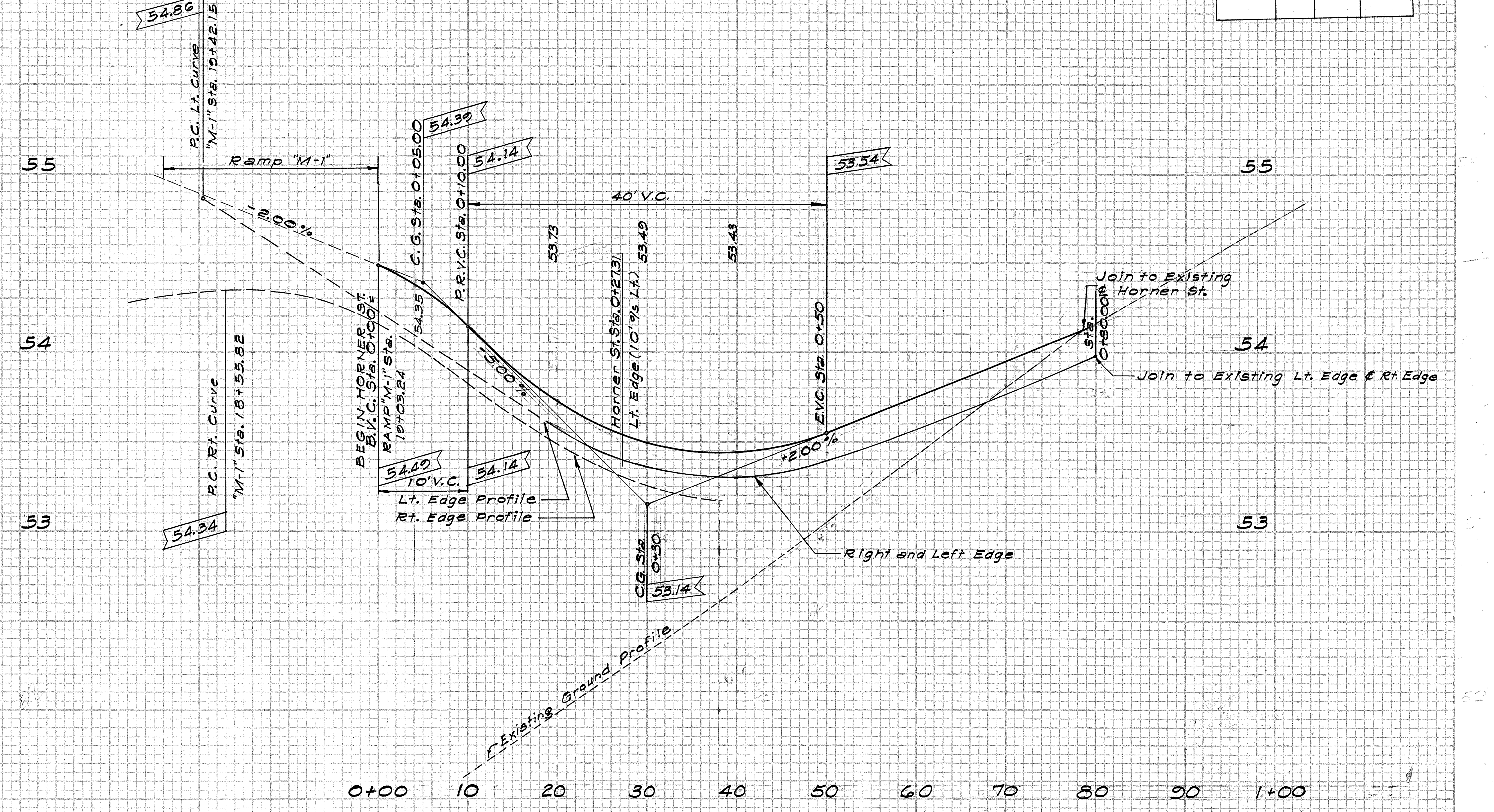
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-072-1(2) UNIT 4	1960	12	118

FINAL SURVEY		BY	DATE
	SURVEYED		
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO. 40	AREAS CHECKED		


60
55
50
45
40
42.75
Ola Lane Sta. 0+00
43.27
B.V.C. Sta. 0+65.00
160' V.C.
48.71
P.R.V.C. Sta. 2+25.00
56.21
C.G. Sta. 3+50.00
Join to "M-1" Lt. Edge
Sta. 4+07.45
END Ola Lane Sta. 4+46.13
12' o/s Rt. =
"M-1" Sta. 16+72.58
55.77
Rt. Edge
-0.745%
+6.00%
Lt. Edge
Station Line
Join to "M-1" Lt. Edge
43.37
43.75
44.34
44.95
45.12
46.12
47.31
50.13
51.37
52.45
53.36
54.10
54.67
55.08
55.31
Lt. Edge
+0.80%
Rt. Edge
Station Line
Sta. 1+45.00 C.G.
43.91
250' V.C.
48.71
E.V.C. Sta. 4+75.00
55.28
0
1
2
3
4
5

OLA LANE PROFILE

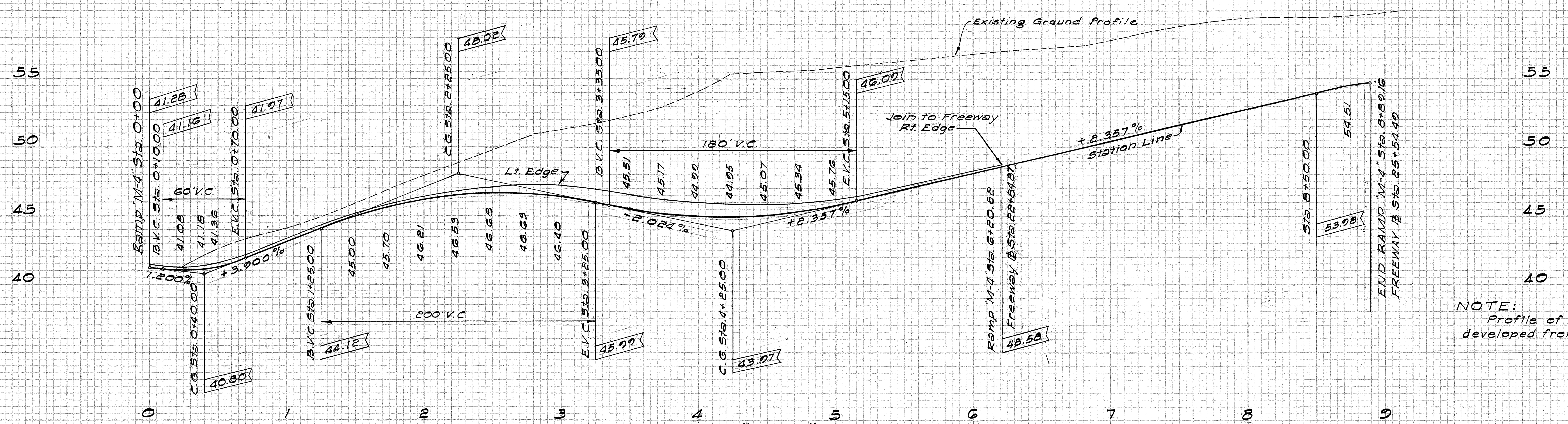
MIDDLE STREET INTERCHANGE


54.86
P.C. Lt. Curve
"M-1" Sta. 19+42.15
55
54
53
Ramp "M-1"
-2.00%
54.39
C.G. Sta. 0+05.00
54.14
P.R.V.C. Sta. 0+10.00
40' V.C.
53.54
53.73
53.49
53.43
Horner St. Sta. 0+27.31
Lt. Edge (10' o/s Lt.)
P.C. Rt. Curve
"M-1" Sta. 18+55.82
54.34
BEGIN HORNER ST.
B.V.C. Sta. 0+00 =
RAMP "M-1" Sta.
19+03.24
54.35
-5.00%
54.49
10' V.C.
54.14
Lt. Edge Profile
Rt. Edge Profile
C.G. Sta. 0+30
53.14
E.V.C. Sta. 0+50
+2.00%
Right and Left Edge
Join to Existing ℄ Horner St.
Sta. 0+80.00
Join to Existing Lt. Edge & Rt. Edge
Existing Ground Profile
0+00
10
20
30
40
50
60
70
80
90
1+00

HORNER STREET PROFILE

MIDDLE STREET INTERCHANGE

ORIGINAL SURVEY		BY	DATE
	SURVEYED		
	PLOTTED		
NOTE BOOK	TEMPLATE		
	AREAS		
NO.	AREAS CHECKED		


Existing Ground Profile
55
50
45
40
41.28
Ramp "M-4" Sta. 0+00
41.16
B.V.C. Sta. 0+10.00
41.97
E.V.C. Sta. 0+70.00
60' V.C.
41.08
41.18
41.36
1.200%
+3.900%
C.G. Sta. 0+40.00
40.80
48.02
C.G. Sta. 2+25.00
Lt. Edge
45.00
45.70
46.21
46.53
46.68
46.63
46.40
B.V.C. Sta. 1+25.00
44.12
200' V.C.
E.V.C. Sta. 3+25.00
45.99
45.79
B.V.C. Sta. 3+35.00
180' V.C.
45.51
45.17
44.99
44.95
45.07
45.34
45.76
E.V.C. Sta. 5+15.00
46.09
-2.024%
+2.357%
C.G. Sta. 4+25.00
43.97
Join to Freeway Rt. Edge
Ramp "M-4" Sta. 6+20.82
Freeway ℄ Sta. 22+84.87
48.58
+2.357%
Station Line
Sta. 8+50.00
53.98
54.51
END RAMP "M-4" Sta. 8+89.16
FREEWAY ℄ Sta. 25+54.49
0
1
2
3
4
5
6
7
8
9

NOTE:
Profile of Ramp "M-4" Station Line is developed from Profile of Freeway ℄

RAMP "M-4" PROFILE

MIDDLE STREET INTERCHANGE

SHEET No. 9 OF 9 SHEETS

PLATE 3 - CROSS SECTION U. P. R. & R. E. STANDARD
KEUFFEL & ESSER CO., NEW YORK.
K & E Co. No. 346-30

S174.12

16