# DRAINAGE SUMMARY

PROJECT: **NIMITZ SPUR**

PROJECT NO.: **I-H1-1(99):15**

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99):15 | 1977 | 137 | 350 |

| ITEM NO. | | 206. 02 | 206. 20 | 503. 002 | 503. 020 | 503. 202 | 602. 020 | 602. 103 | 603. 0010 | 603. 1010 | 603. 1012 | 603. 1014 | 603. 1016 | 603. 1048 | 603. 1054 | 603. 1901 | 603. 6540 | 603. 7020 | 603. 7200 | 603. 7260 | 603. 7320 | 603. 8001 | 604. 011 | 604. 036 | 604. 215 | 604. 216 | 604. 218 | 604. 220 | 604. 231 | 604. 232 | 604. 236 | 604. 237 | 604. 405 | 604. 406 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT USED | | CY | CY | CY | CY | CY | LB | LB | CY | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | EA | EA | EA | EA | EA | EA | EA | EA | EA | EA |
| STRUCTURES FROM DETAILED DRAINAGE PLAN SHEET 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE OF STRUCTURE | STATION (FROM – TO) | STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM | STRUCTURE EXCAVATION FOR BOX CULVERTS | CONCRETE FOR DRAINAGE SYSTEM | CONCRETE IN BOX CULVERT | CLASS "B" CONCRETE FOR DRAINAGE SYSTEM | REINFORCING STEEL IN BOX CULVERTS | REINFORCING STEEL FOR DRAINAGE SYSTEM | BED COURSE MATERIAL FOR CULVERT | 24-INCH RCP, CL. III | 30-INCH RCP, CL. III | 36-INCH RCP, CL. III | 42-INCH RCP, CL. III | 24-INCH RCP, CL. IV | 42-INCH RCP, CL. IV | REMOVE, CLEAN AND RELAY EXISTING PIPE | 24-INCH CMP, 0.079" THK. OR 24-INCH RCP, CL. IV | 18-INCH CMP, 0.079" THK. OR 18-INCH RCP, CL. III 18-INCH ACP, CL. III | 24-INCH CMP, 0.079" THK. OR 24-INCH RCP, CL. III 24-INCH ACP, CL. III | 30-INCH CMP, 0.079" THK. OR 24-INCH RCP, CL. III 24-INCH ACP, CL. III | 30-INCH CMP, 0.079" THK. OR 30-INCH RCP, CL. III 30-INCH ACP, CL. III | 42-INCH RCP, CL. III OR 42-INCH CIP CONCRETE PIPE | BRICK WALL FOR TYPE "D" OR "E" STORM DRAIN MANHOLES | CONCRETE WALL FOR PRECAST STORM DRAIN MANHOLES | TYPE "A" CAST IRON FRAME AND COVER FOR STORM DRAIN MANHOLE | TYPE "B" CAST IRON FRAME AND COVER FOR CATCH BASIN | TYPE "P" CAST IRON FRAME AND COVER FOR PRECAST STORM DRAIN MANHOLE | CAST IRON FRAME AND COVER FOR PRESSURE MANHOLE | TYPE A-9 STEEL FRAME AND GRATE | TYPE A-12 STEEL FRAME AND GRATE | TYPE 616 14 STEEL FRAME AND GRATE | TYPE 612 14 STEEL FRAME AND GRATE | ADJUST MANHOLE INVERT | ADJUST D.I. MANHOLE |
| **DRAIN LINE** | **1, 1A & 1B** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI (TYPE "L") | R-PW 13+75 | 18 | | 4 | | | | 391 | 12 | | | | | | | | | 173 | | | | | | | | | | | 2 | | | | |
| DI (TYPE "K") | R-IH 7+18 | 300 | | 11 | | | | 410 | 18 | | | | | | | | | 247 | | | | | | | | | | | 1 | | | | |
| DMH (TYPE "N") | R-IH 4+86 | 8 | | 2 | | | | 224 | | | | | | | | | | | | | | | | | | 1 | | | | | | | |
| DI (TYPE "D") | R-IH 4+86 | 65 | | | | 2 | | 30 | 5 | | | | | | 40 | | | | | | | | | | | | | 1 | | | | | |
| DI (TYPE "C") | R-IH 3+36 | 136 | | | | 2 | | 11 | 15 | | | | | 40 | | 196 | | | | | | | | | | | | 1 | | | | 1 | 1 |
| DI (TYPE "M") | R-IH 0+00 | 4 | | 1 | | | | 60 | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3.5'×3.5' BOX CULVERT | R-IH (-)0+25 TO 4+86 | | 1300 | | 210 | | 14,100 | | 66 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **DRAIN LINE 2** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI (61614) | R-IH 22+00 | 250 | | 2 | | | | 60 | 18 | | | | | | | | | 250 | | | | | | | | | | | | 1 | | | |
| DI (TYPE "L") | N-PI 22+46 | 229 | | 3 | | | | 344 | 18 | | | | | | | | | 247 | | | | | | | | | | | 2 | | | | |
| DI (TYPE "L") | N-PI 24+91 | 167 | | 4 | | | | 395 | 11 | | | | | | | | | 152 | | | | | | | | | | | 2 | | | | |
| DMH (PRECAST CONCRETE) | N-PI 26+47.5 | 177 | | | | 2 | | 224 | 11 | | | | | | | | | 150 | | | | | 15 | | | 1 | | | | | | | |
| DI (TYPE "L") | N-PI 27+92.78 | 17 | | 4 | | | | 421 | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBTOTAL | 1,541 | 1,300 | 24 | 210 | 6 | 14,100 | 2,570 | 176 | | | | | 40 | 40 | 196 | | 1,219 | | | | | 15 | | | 2 | | 2 | 9 | 1 | 1 | 1 | 1 |

# DRAINAGE SUMMARY

PROJECT: **NIMITZ SPUR**

PROJECT NO.: **I - H1 - 1(99):15**

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99):15 | 1977 | 138 | 350 |

| ITEM NO. | | | 206. 02 | 206. 20 | | 503. 002 | 503. 020 | 503. 202 | | 602. 020 | 602. 103 | | 603. 0010 | 603. 1010 | 603. 1012 | 603. 1014 | 603. 1016 | 603. 1048 | 603. 1054 | 603. 1901 | 603. 6540 | 603. 7020 | 603. 7200 | 603. 7260 | 603. 7320 | 603. 8001 | | 604. 011 | 604. 036 | 604. 215 | 604. 216 | 604. 218 | 604. 220 | 604. 231 | 604. 232 | 604. 236 | 604. 237 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT USED | | | CY | CY | | CY | CY | CY | | LB | LB | | CY | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | | LF | LF | EA | EA | EA | EA | EA | EA | EA | EA | | |
| STRUCTURES FROM DETAILED DRAINAGE PLAN SHEET 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE OF STRUCTURE | STATION (FROM - TO) | | STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM | STRUCTURE EXCAVATION FOR BOX CULVERTS | | CONCRETE FOR DRAINAGE SYSTEM | CONCRETE IN BOX CULVERT | CLASS "B" CONCRETE FOR DRAINAGE SYSTEMS | | REINFORCING STEEL IN BOX CULVERTS | REINFORCING STEEL FOR DRAINAGE SYSTEM | | BED COURSE MATERIAL FOR CULVERT | 24-INCH RCP. CL. III | 30-INCH RCP. CL. III | 36-INCH RCP. CL. III | 42-INCH RCP. CL III | 24-INCH RCP. CL IV | 42-INCH RCP. CL IV | REMOVE, CLEAN AND RELAY EXISTING PIPE | 24-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. IV | 18-INCH CMP. 0.079" THK. OR 18-INCH RCP. CL. III | 18-INCH ACP. CL. III | 24-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. III | 24-INCH ACP. CL. III | 30-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. III | 24-INCH ACP. CL. III | 30-INCH CMP. 0.079" THK. OR 30-INCH RCP. CL. III | 30-INCH ACP. CL. III | 42-INCH RCP. CL. III OR 42-INCH CIP CONCRETE PIPE | | BRICK WALL FOR TYPE "D" OR "E" STORM DRAIN MANHOLES | CONCRETE WALL FOR PRECAST STORM DRAIN MANHOLES | TYPE "A" CAST IRON FRAME AND COVER FOR STORM DRAIN MANHOLE | TYPE "B" CAST IRON FRAME AND COVER FOR CATCH BASIN | TYPE "P" CAST IRON FRAME AND COVER FOR PRECAST STORM DRAIN MANHOLE | CAST IRON FRAME AND COVER FOR PRESSURE MANHOLE | TYPE A-9 STEEL FRAME AND GRATE | TYPE A-12 STEEL FRAME AND GRATE | TYPE 61614 STEEL FRAME AND GRATE | TYPE 61214 STEEL FRAME AND GRATE | | |
| **DRAIN LINE 3,3C,3D & 3E** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DMH (TYPE "A-1") | R-IH 25+53 | | 236 | | | 3 | | | | | 214 | | 15 | | | 152 | | | | | | | | | | | | | | 1 | | | | | | | | | |
| DI (TYPE "K") | R-IH 24+00 | | 222 | | | 3 | | | | | 270 | | 16 | | 188 | | | | | | | | | | | | | | | | | | | | 1 | | | |
| DMH (PRECAST CONCRETE) | R-IH 22+06 | | 211 | | | | | 1 | | | 115 | | 13 | | | | | | | | | | | | 149 | | | | 4 | | | 1 | | | | | | |
| DMH (PRECAST CONCRETE) | R-IH 20+52 | | 442 | | | | | 2 | | | 115 | | 22 | | | | | | | | | | | | 250 | | | | 5 | | | 1 | | | | | | |
| DMH (PRECAST CONCRETE) | R-IH 18+07 | | 401 | | | | | 2 | | | 115 | | 22 | | | | | | | | | | | 250 | | | | 6 | | | 1 | | | | | | |
| DI (61614) | R-IH 15+54 | | 180 | | | 3 | | | | | 60 | | 13 | | | | | | | | | | 170 | | | | | | | | | | | | 1 | | | |
| DMH (TYPE "D") | R-IH 13+78 | | 123 | | | | | 1 | | | 30 | | 9 | | | | | | | | | | 121 | | | | 6 | | 1 | | | | | | | | |
| DI (61614) | R-IH 12+55 | | 77 | | | 3 | | | | | 60 | | 6 | | | | | | | | | | 75 | | | | | | | | | | | | 1 | | | |
| DI (61614) | N-IP 4+88.5 | | 9 | | | 2 | | | | | 60 | | | | | | | | | | | | | | | | | | | | | | | | 1 | | | |
| DI (TYPE "K") | R-HI 6+25 | | 100 | | | 1 | | | | | 221 | | 6 | | | | | | | | | | 79 | | | | | | | | | | | | 1 | | | |
| DI (61214) | R-HI 10+00 | | 127 | | | 3 | | | | | 33 | | 9 | | | | | | | | | | 113 | | | | | | | | | | | | | 1 | | |
| DI (61214) | N-IP 13+37 | | 87 | | | 2 | | | | | 33 | | 5 | | | | | | | | | | 68 | | | | | | | | | | | | | 1 | | |
| **DRAIN LINE 4** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CB (TYPE "1-D") | 19TH WAY EXTN. 2+73 | | 24 | | | 5 | | | | | 293 | | 2 | | | | | | | | | 27 | | | | | | | | 1 | | | | | | | | |
| CB (TYPE "1-D") | 19TH WAY EXTN. 2+59 | | 79 | | | 5 | | | | | 293 | | 7 | | | | | | | | | 120 | | | | | | | | 1 | | | | | | | | |
| DMH (TYPE "D") | 19TH WAY EXTN. 1+48 | | 92 | | | | | 1 | | | 30 | | 8 | | | | | | | | | 147 | | | | | | 5 | | 1 | | | | | | | |
| | SUBTOTAL | | 2,410 | | | 30 | | 7 | | | 1,942 | | 153 | | 188 | 152 | | | | | | 294 | 626 | 250 | 399 | | | 11 | 15 | 5 | | 3 | | | 2 | 3 | 2 | | |

# DRAINAGE SUMMARY

PROJECT: **NIMITZ SPUR**

PROJECT NO.: **I - H1 - 1(99):15**

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99):15 | 1977 | 139 | 350 |

| ITEM NO. | | | 206. 02 | 206. 20 | | 503. 002 | 503. 020 | 503. 202 | | 602. 020 | 602. 103 | | 603. 0010 | 603. 1010 | 603. 1012 | 603. 1014 | 603. 1016 | 603. 1048 | 603. 1054 | 603. 1901 | 603. 6540 | 603. 7020 | 603. 7200 | 603. 7260 | 603. 7320 | 603. 8001 | | 604. 011 | 604. 036 | 604. 215 | 604. 216 | 604. 218 | 604. 220 | 604. 231 | 604. 232 | 604. 236 | 604. 237 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT USED | | | CY | CY | | CY | CY | CY | | LB | LB | | CY | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | | LF | LF | EA | EA | EA | EA | EA | EA | EA | EA | | |
| STRUCTURES FROM DETAILED DRAINAGE PLAN SHEET 7 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE OF STRUCTURE | STATION (FROM - TO) | | STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM | STRUCTURE EXCAVATION FOR BOX CULVERTS | | CONCRETE FOR DRAINAGE SYSTEM | CONCRETE IN BOX CULVERT | CLASS "B" CONCRETE FOR DRAINAGE SYSTEM | | REINFORCING STEEL IN BOX CULVERTS | REINFORCING STEEL FOR DRAINAGE SYSTEM | | BED COURSE MATERIAL FOR CULVERT | 24-INCH RCP, CL. III | 30-INCH RCP, CL. III | 36-INCH RCP, CL. III | 42-INCH RCP, CL. III | 24-INCH RCP, CL. IV | 42-INCH RCP, CL. IV | REMOVE, CLEAN AND RELAY EXISTING PIPE | 24-INCH CMP, 0.079" THK., OR 24-INCH RCP, CL. IV | 18-INCH CMP, 0.079" THK., OR 18-INCH RCP, CL. III, OR 18-INCH ACP, CL. III | 24-INCH CMP, 0.079" THK., OR 24-INCH RCP, CL. III, OR 24-INCH ACP, CL. III | 30-INCH CMP, 0.079" THK., OR 24-INCH RCP, CL. III, OR 24-INCH ACP, CL. III | 30-INCH CMP, 0.079" THK., OR 30-INCH RCP, CL. III, OR 30-INCH ACP, CL. III | 42-INCH RCP, CL. III, OR 42-INCH CIP CONCRETE PIPE | | BRICK WALL FOR TYPE "D" OR "E" STORM DRAIN MANHOLES | CONCRETE WALL FOR PRECAST STORM DRAIN MANHOLES | TYPE "A" CAST IRON FRAME AND COVER FOR STORM DRAIN MANHOLE | TYPE "B" CAST IRON FRAME AND COVER FOR CATCH BASIN | TYPE "P" CAST IRON FRAME AND COVER FOR PRECAST STORM DRAIN MANHOLE | CAST IRON FRAME AND COVER FOR PRESSURE MANHOLE | TYPE A-9 STEEL FRAME AND GRATE | TYPE A-12 STEEL FRAME AND GRATE | TYPE 616 14 STEEL FRAME AND GRATE | TYPE 612 14 STEEL FRAME AND GRATE | | |
| **DRAIN LINE 5** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CB (TYPE "C") | CENTER DRIVE 2+32 | | 100 | | | 7 | | | | | 110 | | 6 | | 65 | | | | | | | | | | | | | 5 | | 1 | 1 | | | | | | | | |
| DI (TYPE "C") (4) | | | 107 | | | 2 | | | | | 11 | | 8 | | 93 | | | | | | | | | | | | | | | | | | | 1 | | | | | |
| DMH (TYPE "D") | N-IP 16+46.5 O/S 62.5' RT. | | 201 | | | | | 1 | | | 30 | | 14 | 186 | | | | | | | | | | | | | | 5 | | 1 | | | | | | | | |
| DI (TYPE 61614) | N-IP 14+00 | | 228 | | | 3 | | | | | 60 | | 18 | | | | | | | | | | 247 | | | | | | | | | | | | 1 | | | |
| DI (TYPE 61614) | N-IP 11+66 | | 246 | | | 3 | | | | | 60 | | 18 | | | | | | | | | | 236 | | | | | | | | | | | | 1 | | | |
| DI (TYPE 61614) | N-IP 9+25 | | 237 | | | 2 | | | | | 60 | | 19 | | | | | | | | | | 250 | | | | | | | | | | | | 1 | | | |
| **DRAIN LINE 5A** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI (TYPE "L") | N-PI 3+30 | | 204 | | | 4 | | | | | 405 | | 12 | | | | | | | | | | 163 | | | | | | | | | | | 2 | | | | |
| DI (TYPE "L") | N-PI 0+99 | | 226 | | | 3 | | | | | 340 | | 17 | | | | | | | | 51 | | 180 | | | | | | | | | | | 2 | | | | |
| **DRAIN LINE 5B** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DI (TYPE "L") | N-PI 5+78 | | 137 | | | 3 | | | | | 341 | | 10 | | | | | | | | | | 126 | | | | | | | | | | | 2 | | | | |
| | SUBTOTAL | | 1,686 | | | 27 | | 1 | | | 1,417 | | 122 | 186 | 158 | | | | | | 51 | | 1,202 | | | | | 5 | | 1 | 1 | | | 1 | 6 | 3 | | | |

# DRAINAGE SUMMARY

PROJECT: **NIMITZ SPUR**

PROJECT NO.: **I - H1 - 1(99):15**

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99):15 | 1977 | 140 | 350 |

| ITEM NO. | | | 206. 02 | 206. 20 | | 503. 002 | 503. 020 | 503. 202 | | 602. 020 | 602. 103 | | 603. 0010 | 603. 1010 | 603. 1012 | 603. 1014 | 603. 1016 | 603. 1048 | 603. 1054 | 603. 1901 | 603. 6540 | 603. 7020 | 603. 7200 | 603. 7260 | 603. 7320 | 603. 8001 | | 604. 011 | 604. 036 | 604. 215 | 604. 216 | 604. 218 | 604. 220 | 604. 231 | 604. 232 | 604. 236 | 604. 237 | 604. 405 | 604. 406 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| UNIT USED | | | CY | CY | | CY | CY | CY | | LB | LB | | CY | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | LF | | LF | LF | EA | EA | EA | EA | EA | EA | EA | EA | EA | EA |
| STRUCTURES FROM DETAILED DRAINAGE PLAN SHEET 8 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TYPE OF STRUCTURE | STATION (FROM - TO) | | STRUCTURE EXCAVATION FOR DRAINAGE SYSTEM | STRUCTURE EXCAVATION FOR BOX CULVERTS | | CONCRETE FOR DRAINAGE SYSTEM | CONCRETE IN BOX CULVERT | CLASS "B" CONCRETE FOR DRAINAGE SYSTEMS | | REINFORCING STEEL IN BOX CULVERTS | REINFORCING STEEL FOR DRAINAGE SYSTEM | | BED COURSE MATERIAL FOR CULVERT | 24-INCH RCP. CL. III | 30-INCH RCP. CL. III | 36-INCH RCP. CL. III | 42-INCH RCP. CL. III | 24-INCH RCP. CL. IV | 42-INCH RCP. CL. IV | REMOVE, CLEAN AND RELAY EXISTING PIPE | 24-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. IV | 18-INCH CMP. 0.079" THK. OR 18-INCH RCP. CL. III 18-INCH ACP. CL. III | 24-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. III 24-INCH ACP. CL. III | 30-INCH CMP. 0.079" THK. OR 24-INCH RCP. CL. III 24-INCH ACP. CL. III | 30-INCH CMP. 0.079" THK. OR 30-INCH RCP. CL. III 30-INCH ACP. CL. III | 42-INCH RCP. CL. III OR 42-INCH CIP CONCRETE PIPE | | BRICK WALL FOR TYPE "D" OR "E" STORM DRAIN MANHOLES | CONCRETE WALL FOR PRECAST STORM DRAIN MANHOLES | TYPE "A" CAST IRON FRAME AND COVER FOR STORM DRAIN MANHOLE | TYPE "B" CAST IRON FRAME AND COVER FOR CATCH BASIN | TYPE "D" CAST IRON FRAME AND COVER FOR PRECAST STORM DRAIN MANHOLE | CAST IRON FRAME AND COVER FOR PRESSURE MANHOLE | TYPE A-9 STEEL FRAME AND GRATE | TYPE A-12 STEEL FRAME AND GRATE | TYPE 616 14 STEEL FRAME AND GRATE | TYPE 612 14 STEEL FRAME AND GRATE | ADJUST MANHOLE INVERT | ADJUST D.I. MANHOLE |
| **DRAIN LINE 3** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DMH (TYPE "P") | VANDENBURG BLVD. 9+90 | | 545 | | | 2 | | | | | 266 | | 29 | | | | | | | | | | | | | 261 | | | | 1 | | | | | | | | | |
| DMH (TYPE "E") | VANDENBURG BLVD. 7+23 | | 525 | | | | | 2 | | | 104 | | 32 | | | | | | | | | | | | | 288 | | 9 | | | | | 1 | | | | | | |
| DMH (TYPE "S") | VANDENBURG BLVD. 4+03 | | 204 | | | 6 | | | | | 1715 | | 13 | | | | | | 115 | | | | | | | | | | | | | 1 | | | | | | | |
| DMH (TYPE "A-1") | VANDENBURG BLVD. 2+89 | | 168 | | | 3 | | 40 | | | 255 | | 16 | | | | 140 | | | | | | | | | | | | | | | 1 | | | | | | | |
| DMH (TYPE "A-1") | VANDENBURG BLVD. 1+46 | | 340 | | | 2 | | 16 | | | 255 | | 24 | | | 245 | | | | | | | | | | | | | | 1 | | | | | | | | | |
| DI (TYPE "L") | R-IH 30+03 | | 322 | | | 4 | | | | | 486 | | 20 | | | 200 | | | | | | | | | | | | | | | | | | 2 | | | | | |
| DI (TYPE "L") | R-IH 28+03 | | 408 | | | 5 | | | | | 490 | | 25 | | | 250 | | | | | | | | | | | | | | | | | | 2 | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| **MOKULELE SCHOOL (SHT.59)** | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 8-INCH DRAIN PIPE<br>WING WALL | AT CAFETERIA<br>SERVICE RAMP | | 1 | | | 2 | | | | | 80 | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | SUBTOTAL | | 2,513 | | | 24 | | 58 | | | 3,651 | | 159 | | | 695 | 140 | | 115 | | | | | | | 549 | | 9 | | 2 | | | 3 | | 4 | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | TOTAL | | 8,150 | 1,300 | | 105 | 210 | 72 | | 14,100 | 9,580 | | 610 | 186 | 346 | 847 | 140 | 40 | 155 | 196 | 51 | 294 | 3,047 | 250 | 399 | 549 | | 25 | 30 | 8 | 1 | 5 | 3 | 3 | 21 | 7 | 3 | 1 | 1 |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-(22)15 | 1977 | 141 | 350 |

DEMOLISH & REMOVE EXIST. DRAIN INTAKE
CONSTRUCT: DI (15)
(TYPE "D", W/A-9 FRAME & GRATING, OPENING: 3'-0" x 0'-6")
R-IH ℄ 4+86, 9.6 105' RT.
INV. = 22.2± (EXIST. 12")
INV. = 20.2± (EXIST. 36")
INV. = 19.8 (42")

DI (3)
(TYPE "K")
R-IH ℄ 7+18
INV. = 24.5
END G16/8 GUTTER

DI (1)
(TYPE "L")
R-PW ℄ 13+75
INV. = 29.7

EXIST. CB
INV. = 20.25
(TO REMAIN)

EXIST. 12" RCP (TO REMAIN)

DRAIN LINE-1A

(15) REMOVE EXIST. STORM DRAIN LINE & INSTALL 36" CUT & PLUG RCP, CL. IV (NO OPTION)

EXIST. 12" RCP TO BE ABANDONED

EXIST. DI (13)
(RAISE INVERT FROM 21.5 TO 21.9)

(18) 12" RCP, CL. IV (NO OPTION)

(11) DMH (TYPE "D")
R-IH ℄ 1+76 9.6 105' RT.
INV. = 21.6

DRAIN LINE-1B

(10) 12" RCP CL. IV (NO OPTION)
EXIST. 24" RCP (REMOVE)

CUT & PLUG

EXIST. 36" RCP (ABANDON)

(8) 24" RCP, CL. IV (NO OPTION)

DRAIN LINE - 1 ⚠

℄ TYPE G12/8 GUTTER

R-IH ℄ (-)0+25 CONN. TO 3.5'x3.5' BOX CULVERT (BY OTHERS)

(6) 3.5' x 3.5' BOX CULVERT (SEE DETAIL, SHT. 146)

DRIVE

3.5'x3.5' BOX CULV. (BY OTHERS)

DI (7)
(TYPE "M")
R-IH ℄ 0+00, 9 RT.
INV. = 18.1
(SEE DETAIL, SHT. 146)

DI (BY OTHERS)
INV. = 17.6

CONN. 24" RCP TO BOX CULVERT
R-IH ℄ 3+36, 9 65' RT.
INV. = 19.1 (BOX CULV.)
INV. = 20.3 (24")

CONN. 18" RCP TO BOX CULVERT
R-IH ℄ 1+76 9 71' RT.
INV. = 18.6 (BOX CULVERT)
INV. = 20.3 (18")

DEMOLISH & REMOVE EXIST. DI
CONSTRUCT: DI (9)
(TYPE "C", W/A-9 FRAME & GRATING)
R-IH ℄ 3+36, 9 105' RT.
INV. = 20.5

24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK
(2) (4)

42" RCP, CL. IV (14)
(NO OPTION)

EXIST. DMH (DEMOLISH & REMOVE)

DMH (5)
(TYPE "N")
R-IH ℄ 4+86, 9 65' RT.
INV. = 19.6
(SEE DETAIL, SHT. 147)

(21) (23) 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

24" RCP (BY OTHERS)

DELETE APPROX. 165' 24" DRAIN

DRAIN LINE - 2

HAWAIIAN ELECTRIC TRANSFORMER PADS

N-IP

R-IH

R-PW

R-HI

N-PI

℄ TYPE G16/8 GUTTER

45' TRANSITION FROM 6:1 SLOPE TO 2.6 %

10' TRANSITION FROM 6:1 SLOPE S.E.

HIGHWAY

NIMITZ

DRIVE

MELICK AVE.

REYNOLDS AVE.

T-1326 T-1327 T-1328 T-1329 T-1330 T-1331 T-1332 T-1333 T-1334 T-1335 T-1336 T-1337 T-1338 T-1339 T-1340 T-1341 T-1342 T-1343 T-1344 T-1345 T-1346 T-1347 T-1348 T-1349 T-1350 T-1351 T-1352 T-1353 T-1354 T-1355 T-1356 T-1357 T-1358 T-1359 T-1360

DI (18)
(TYPE "L")
N-PI ℄ 22+46
INV. = 23.0
(SEE DETAIL, SHT. 146)

DI (20)
(TYPE "L")
N-PI ℄ 24+91
INV. = 20.5
(SEE DETAIL, SHT. 146)

DMH (22)
(TYPE "PRECAST CONC.")
N-PI ℄ 26+47.5 ~~28'~~
INV. = ~~19.4~~ 18.58

DI (24)
(TYPE "L")
N-PI ℄ 27+92.78
INV. = 18.5
(SEE DETAIL, SHT. 146)

DI (16)
(TYPE G16/14")
R-HI ℄ 22+00
INV. = 25.0

(17) (19) 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

BEG. PROJ. I-HI-1(99):15
END PROJ. I-HI-1(73):15 (BY OTHERS)

TRUE NORTH
SCALE: 1" = 50'

## PLAN
SCALE: 1" = 50'

(2) (4) INVERT
24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

(6) INVERT
3.5' x 3.5' BOX CULVERT

INVERT
3.5' x 3.5'
BOX CULVERT
(BY OTHERS)

(6) INVERT
3.5' x 3.5'
BOX CULVERT

FINISH GROUND

EXIST. GROUND

4" WATER

S=0.030 L=175'

S=0.020 L=247'

S=0.005 L=466'

L=75'

S=0.0045

S=0.00045 L=25'

DI (1) 29.7

DI (3) 24.5

DMH (5) 19.6

20.3 / 19.1 24" BOX CULVERT

12" BOX CULVERT 20.3 / 19.6

DI (7) 19.1

CONN. TO EXIST 36"x36" BOX CULVERT 19.0

DI (7) 17.6 (BY OTHERS)

## DRAIN LINE - 1

(17) (19) INVERT
24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

(21) (23) INVERT
24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

INVERT
24" RCP
(BY OTHERS)

FINISH GROUND

EXIST. GROUND

S=0.008 L=250'

4" WATER W/REINF. CONC. JACKET

S=0.010 L=247'

S=0.007 L=152'

4" WATER

S=0.005 L=150'

4" WATER W/REINF. CONC. JACKET

HTCO DUCTS

S=0.005 L=155'

DELETE APPROX. 165', 24" DRAIN

DI (16) 25.0

DI (18) 25.0

DI (20) 20.5

DMH (22) 19.4

DI (24) 18.5

18.0 / 17.1 24" BOX CULVERT

## DRAIN LINE - 2

## PROFILES
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

(16) INV. 36" RCP CL. IV (NO OPTION)

(14) INVERT 42" RCP, CL. IV (NO OPTION) S=0.005 L=40'

FINISH GROUND

EXIST. GROUND

S=0.000 L=163'±

HECO DUCTS

2-27" SEWER W/REINF. CONC. JACKET

4" GAS

DMH (9) 19.6

DI (15) 22.2± / 20.2± 36" (EXIST.) 42" 19.8

EXIST. CB (TO REMAIN) 20.25

## DRAIN LINE-1A ⚠2

EXIST. GROUND

9 LF REINF. CONC. JACKET

FINISH GROUND

INVERT 12" RCP CL. IV L=32 S=0.01 (10)

(12) INVERT 12" RCP CL. IV L=42 S=0.0075

(5) INV. 24" RCP, CL. IV S=0.005 L=40 (NO OPTION)

2-27" SEWER

4" GAS

HECO DUCTS

50" SEWER

12" BOX CULVERT 20.3 / 18.6

DMH (11) 21.6

DI (13) 21.9

4" GAS

HECO DUCTS

24" BOX CULVERT 20.3 / 19.1

DI (9) 20.5

## DRAIN LINE-1C

## DRAIN LINE-1B

| REVISION | DATE | BRIEF | BY | APPR'D |
|---|---|---|---|---|
| ⚠2 | 6/30/77 | REVISE PLAN & PROFILE DRAIN LINE 1-A | P.H. | |
| ⚠1 | 4/18/77 | REVISE DRAIN LINE CONN. | A.H. | |

PAUL M. HIROTA REGISTERED PROFESSIONAL ENGINEER No. 1449 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTION
HIGHWAYS DIVISION

# NIMITZ SPUR
# DETAILED DRAINAGE PLAN & PROFILE

INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99)15

SCALE: AS NOTED DATE: AUG 4 1976

SHEET NO. 5 OF 21 SHEETS

PLAN: SURVEYED, PLOTTED, DRAWN, CHECKED, RT. OF WAY CHECKED, NOTE BOOK, NO.
PROFILE: SURVEYED, PLOTTED, DRAWN, CHECKED, B. M.'S NOTED, STRUCTURE NOTATN'S CHK'D., DATE, BY

(14-1)

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-(09)15 | 1977 | 142 | 350 |

| PLAN | DATE | BY |
|---|---|---|
| SURVEYED | | |
| PLOTTED | | |
| NOTE BOOK | CHECKED | |
| NO. | R/W CHECKED | |

| PROFILE | DATE | BY |
|---|---|---|
| SURVEYED | | |
| PLOTTED | | |
| NOTE BOOK | CHECKED | |
| NO. | B. M.'S NOTED | |
| | STRUCTURE NOTATNS CHKD. | |

FOR CONTINUATION SEE SHT. 144 MATCH LINE

DMH (15) (TYPE "A-1") K-IH ℄ 25+53 % 38' RT. INV. = 14.2

(16) 36" RCP, CL. III (NO OPTION)

DI (17) (TYPE "K") K-IH ℄ 24+00 INV.=15.1 (SEE DETAIL, SHT. 147)

18" RCP, CL. III
18" ACP, CL. III
18" CMP, 0.079 THICK
(2) (4) (6)

EXIST. 18" CMP (TO REMAIN)

CB (3) (TYPE "J-D") 19TH WAY EXTN. ℄ 2+59 INV. = 24.4

℄ 19TH WAY EXTENSION

DRAIN LINE - 4

DMH (5) (TYPE "D") 19TH WAY EXTENSION ℄ 1+48 % 25' LT. INV.=24.8

EXIST. DI INV. = 27.0

CB (1) (TYPE "J-D") CONSTRUCT OVER EXIST. 16" CMP 19TH WAY EXTENSION ℄ 2+73 INV.=24.5±

DRAIN LINE - 2

DRAIN LINE - 2C

R-IH

R-HI

DRAIN LINE - 3

℄ TYPE "G1618" GUTTER

DRAIN LINE - 3E

PEDESTRIAN OVERPASS

24" RCP, CL. III (54) (56)
24" ACP, CL. III
24" CMP, 0.079 THICK

(18) 30" RCP, CL. III (NO OPTION)

DI (55) (TYPE "K") K-HI ℄ 6+25 INV. = 17.0

DMH (19) (TYPE "PRECAST CONC.") K-IH ℄ 22+06 % 30.5 RT. INV.= 15.9

30" RCP, CL. III (20) (22)
30" ACP, CL. III
30" CMP, 0.079 THICK

DMH (23) (TYPE "PRECAST CONC.") K-IH ℄ 18+07 % 7' LT. INV.= 20.1

24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK (30)

24" RCP, CL. III (24)
24" ACP, CL. III
30" CMP, 0.079 THICK

DI (25) (TYPE "G1614") K-IH ℄ 15+54 INV.= 21.3

150' TRANSITION FROM "G1618" TO "G1614" GUTTER

DI (57) (TYPE "G1214") K-HI ℄ 10+00 INV.= 20.0

DMH (21) (TYPE "PRECAST CONC.") K-IH ℄ 20+52 % 59.5 RT. INV.= 18.9

DI (59) (TYPE "G1214") K-HI ℄ 13+37 INV.= 21.5

RAMP PIERS LOCATIONS

FIRST HAWAIIAN BANK

MOKULELE ELEMENTARY SCHOOL

NOTE: SEE SHT. 59 FOR MOKULELE SCHOOL 8" DRAIN PIPE WING WALL

PLAN
SCALE: 1" = 50'

NIMITZ

H-1

℄ TYPE "G1618" GUTTER

DRAIN LINE - 5

DI (16) (TYPE "G1614") N-IP ℄ 2+25 INV.= 28.3

TRUE NORTH SCALE: 1" = 50'

(26) (28) (30) 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

DMH (27) (TYPE "D") K-IH ℄ 13+78 % 7' LT. INV. = 22.2

DI (29) (TYPE "G1614") K-IH ℄ 12+55 INV. = 22.8

DI (31) (TYPE "G1614") N-IP ℄ 4+98.5 INV. = 26.6

MATCH LINE "(FOR CONTINUATION, SEE SHT. 144)"

(14) INV.-36" RCP, CL. III (NO OPTION) S=0.003, L=250'

(12) INVERT 36" RCP, CL. III (NO OPTION)

(18) INVERT 30" RCP, CL. III (NO OPTION)

(20) (22) INVERT
30" RCP, CL. III
30" ACP, CL. III
30" CMP, 0.079 THICK

(24) INV.-24" RCP, CL. III
24" ACP, CL. III
30" CMP, 0.079 THICK

(26) (28) (30) INV.-24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079 THICK

EXIST. GROUND

FINISH GROUND

S=0.005 L=152' | S=0.005 L=188' | S=0.020 L=149' | S=0.005 L=250' | S=0.005 L=250' | S=0.005 L=170' | S=0.005 L=121' | S=0.050 L=75'

12" WATER W/ CONC. JACKET

20" WATER W/ CONC. JACKET

DMH (15) 14.2 | DI (17) 15.1 | DMH (19) 15.9 | DMH (21) 18.9 | DMH (23) 20.1 | DI (25) 21.3 | DMH (27) 22.2 | DI (29) 22.8 | DI (31) 26.6

## DRAIN LINE - 3

(54) INVERT 24" RCP, CL. III 24" ACP, CL. III 24" CMP, 0.079 THICK

FINISH GROUND

EXIST. GROUND

S=0.035 L=79'

DI (15) 14.2 | DI (55) 17.0

## DRAIN LINE - 3C

(56) INVERT 24" RCP, CL. III 24" ACP, CL. III 24" CMP, 0.079 THICK

EXIST. GROUND

FINISH GROUND

4" WATER

S=0.036 L=113'

DI (19) 15.9 | DI (57) 20.0

## DRAIN LINE - 3D

(58) INVERT 24" RCP, CL. III 24" ACP, CL. III 24" CMP, 0.079 THICK

EXIST. GROUND

FINISH GROUND

4" WATER

S=0.0206 L=68'

DMH (23) 20.1 | DI (59) 21.5

## DRAIN LINE - 3E

(2) (4) (6) INVERT 18" RCP, CL. III 18" ACP, CL. III 18" CMP, 0.079 THICK

FINISH GROUND

EXIST. GROUND

S=0.003 L=120' | S=0.015 L=147'

J.T.S. DUCTS

A.E. DUCTS

S=0.005 L=27'

CB (3) 24.4 | CB (1) 24.3 | DMH (5) 24.8 | EXIST. DI 27.0

## DRAIN LINE - 4

## PROFILES
SCALES: HORIZ. 1" = 50'
VERT. 1" = 10'

PAUL M. HIROTA REGISTERED PROFESSIONAL ENGINEER No. 1449 HAWAII, U.S.A.

Paul M. Hirota

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTION
HIGHWAYS DIVISION

# NIMITZ SPUR
# DETAILED DRAINAGE PLAN & PROFILE
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(09)15

SCALE: AS NOTED DATE: AUG 4 1976

SHEET NO. 3 OF 21 SHEETS

142

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99)15 | 1977 | 143 | 350 |

**NOTE:**

1. RESURFACING OF ASPHALT PAVEMENT FOR BLOC ARENA & BANK OF HAWAII PARKING LOTS SHALL BE INCIDENTAL TO (1) & (7).
2. REPLACEMENT OF FENCE, CONC. CURB & SIDEWALK AT BLOC ARENA PARKING LOT SHALL BE INCIDENTAL TO 30" RCP, (1).
3. CONNECTION TO EXISTING D.I. SHALL BE INCIDENTAL TO (1)

PLAN — SURVEYED, PLOTTED, DESIGNED, QUANTITIES CHECKED, ALIGNMENT CHECKED, RT. OF WAY CHECKED, NOTE BOOK, NO.; BY; DATE

PROFILE — SURVEYED, PLOTTED, DESIGNED, QUANTITIES CHECKED, B.M.'S NOTED, STRUCTURE NOTATIONS CHKD.; BY; DATE

EXIST. 30" RCP (TO REMAIN)

EXIST. 24" RCP (TO REMAIN)

EXIST. DI
INV. = 8.2 (EXIST. 30" & 24")
INV. = 9.7 (NEW 30")

EXIST. DI

CB (2)
(TYPE "C")
CENTER DRIVE ℄ 2+32
INV. = 11.0

(1) (3) 30" R.C.P. CL. III (NO OPTION)

D.I (4)
(TYPE "C" W/A-9)
FRAME & GRATING
INV. = 12.9 (30")
INV. = 14.3 (24")

TRUE NORTH
SCALE: 1" = 50'

(5) 24" R.C.P. CL. III (NO OPTION)

MH (6)
(TYPE "D")
N-IP ℄ 16+46.5 92' RT.
INV. = 20.4

DI (8)
(TYPE "G1614")
N-IP ℄ 14+00
INV. = 22.6

(7) 24" R.C.P. CL. III
24" A.C.P. CL. III
24" CMP, 0.079" THICK

(19) (21) 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079" THICK

(9) (11) 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079" THICK

DI (12)
(TYPE "G1614")
N-IP ℄ 9+25
INV. = 28.3

DI (10)
(TYPE "G1614")
N-IP ℄ 11+26
INV. = 25.8

℄ TYPE "G1618" GUTTER

℄ TYPE "G1618" GUTTER

DRAIN LINE-5

DRAIN LINE-5A

DRAIN LINE-5B

DI (16)
(TYPE "L")
N-IP ℄ 0+99
INV. = 22.4

(17) 24" R.C.P. CL. IV
24" CMP, 0.070" THICK
51 LF

(15) 24" R.C.P. CL. III
24" CMP, 0.070" THICK
180 LF

DI (22)
(TYPE "L")
N-IP ℄ 5+78
INV. = 26.4

DI (20)
(TYPE "L")
N-PI ℄ 3+30
INV. = 21.2

N-IP

R-PW

N-PI

NORTH RD

CENTER DRIVE

SOUTH DRIVE

NIMITZ HIGHWAY

## PLAN
SCALE: 1" = 50'

## DRAIN LINE-5

(1) INVERT 30" RCP, CL. III (NO OPTION)

(3) INVERT 30" RCP, CL. III (NO OPTION)

(5) INVERT 24" RCP, CL. III (NO OPTION)

(7) INVERT 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079" THICK

(9) (11) INVERT 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079" THICK

FINISH GROUND

EXIST. GROUND

S=0.020 L=65'

S=0.020 L=23'

S=0.033 L=182'

S=0.009 L=247'

S=0.005 L=236'

S=0.018 L=250'

E/N ELEC. DUCTS

EXIST. 21" SEWER

EXIST. 30" SEWER

4" GAS

HTCO DUCTS

4" WATER

J.T.S. DUCTS

HTCO & A.I.R. DUCTS

DMH (6) 20.4

DI (8) 22.6

DI (10) 25.8

DI (12) 28.5

C.B. (2) 11.0

D.I. (4) 12.9 / 14.3 (30" / 24")

EXIST. DI 9.7 / 8.2 (NEW 30" / EXIST. 30" & 24")

## DRAIN LINE-5A

(19) INVERT 24" R.C.P. CL. III
24" A.C.P. CL. III
24" CMP, 0.079" THICK

(15) INVERT 24" R.C.P. CL. III
24" C.M.P., 0.079" THICK

(17) INVERT 24" R.C.P. CL. IV
24" CMP, 0.079" THICK

51 L.F.

FINISH GROUND

EXIST. GROUND

4" WATER

S=0.005± L=163'

S=0.005± L=231'

HTCO DUCTS

4" GAS

D.I. (20) 21.2

D.I. (16) 22.4

DMH (6) 20.4

## DRAIN LINE-5B

(21) INVERT 24" RCP, CL. III
24" ACP, CL. III
24" CMP, 0.079" THICK

FINISH GROUND

EXIST. GROUND

4" WATER

S=0.030 L=126'

DI (8) 22.6

DI (22) 22.4

## PROFILES
SCALES: HORIZ. = 1" = 50'
VERT. = 1" = 10'

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | REVISED ROADWAY GEOMETRICS AT NIMITZ GATE | | 3-0-79 |

PAUL M. HIROTA
REGISTERED PROFESSIONAL ENGINEER
No. 1449
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTION
HIGHWAYS DIVISION

# NIMITZ SPUR
# DETAILED DRAINAGE PLAN & PROFILE
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99): 15

SCALE: AS NOTED DATE: AUG 4 1976

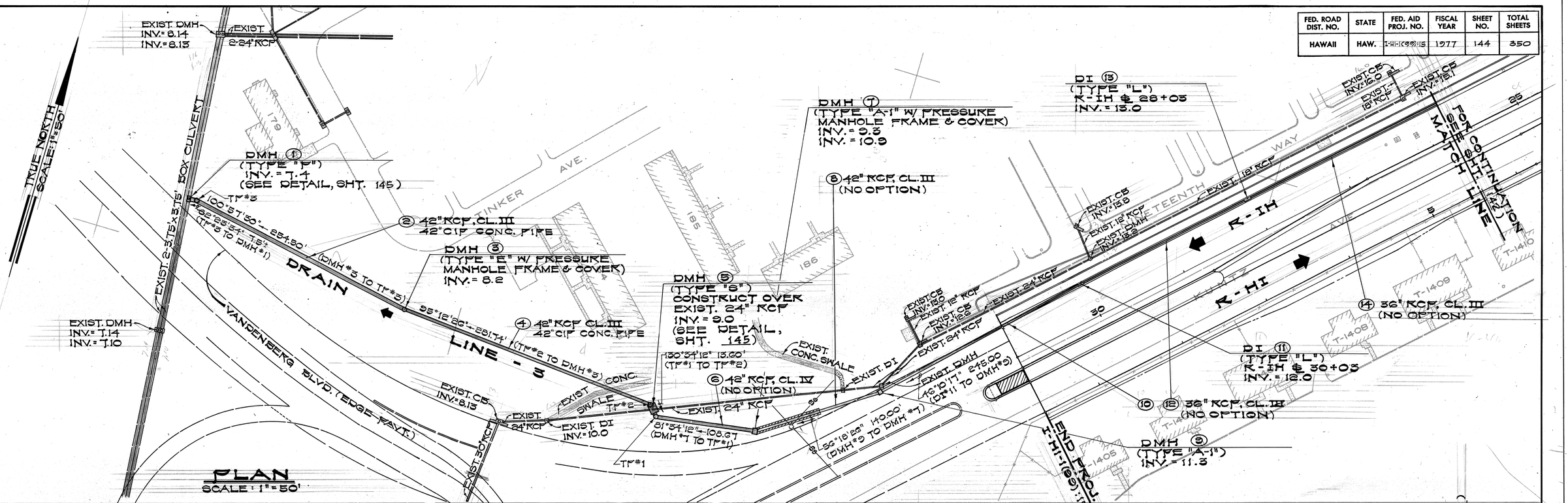
SHEET NO. 7 OF 21 SHEETS

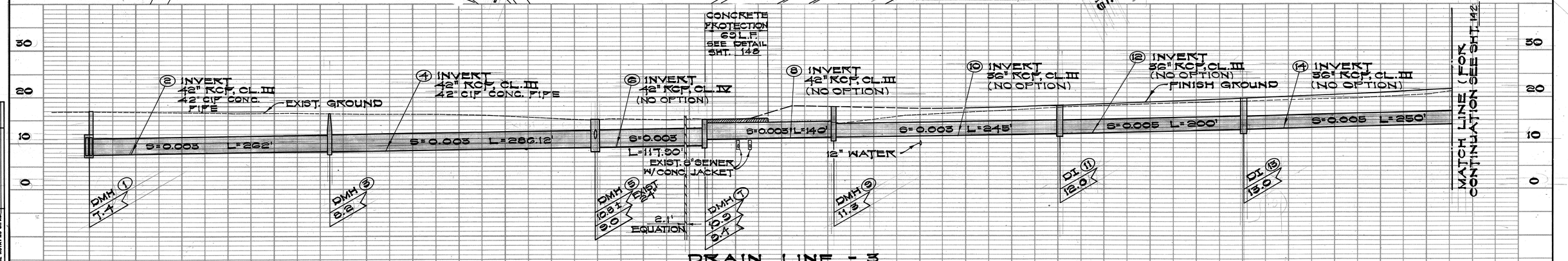
143

C-J-7

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99)15 | 1977 | 144 | 350 |

| PLAN | | BY | DATE |
|---|---|---|---|
| SURVEYED | | | |
| PLOTTED | | | |
| NOTE BOOK | DRAWING CHECKED | | |
| NO. | R.W.'S NOTED | | |
| | ST. OF WAY CHECKED | | |
| | STRUCTURE NOTATIONS CHKD. | | |




DRAIN LINE - 3

NOTE: "CIP CONC. PIPE" SHALL BE CAST-IN-PLACE CONCRETE PIPE

PROFILES
SCALES: HORIZ. 1"=50'
VERT. 1"=10'

| PROFILE | | BY | DATE |
|---|---|---|---|
| SURVEYED | | | |
| PLOTTED | | | |
| NOTE BOOK | DRAWING CHECKED | | |
| NO. | R.W.'S NOTED | | |
| | STRUCTURE NOTATIONS CHKD. | | |

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTION
HIGHWAYS DIVISION

NIMITZ SPUR

DETAILED DRAINAGE PLAN & PROFILE

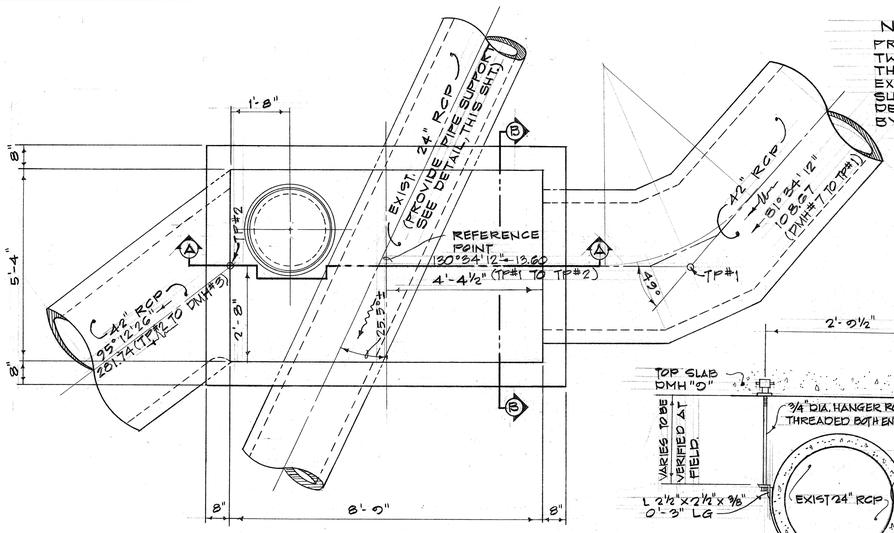
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99)15

SCALE: AS NOTED DATE: AUG 4 1976

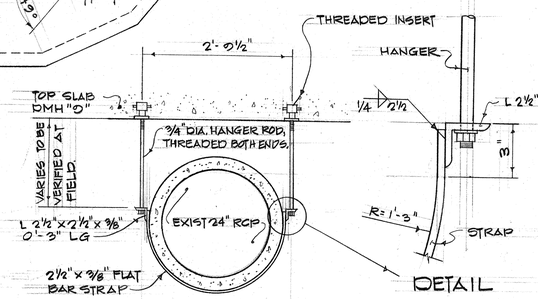
SHEET NO. 8 OF 21 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(009):15 | 1977 | 145 | 350 |

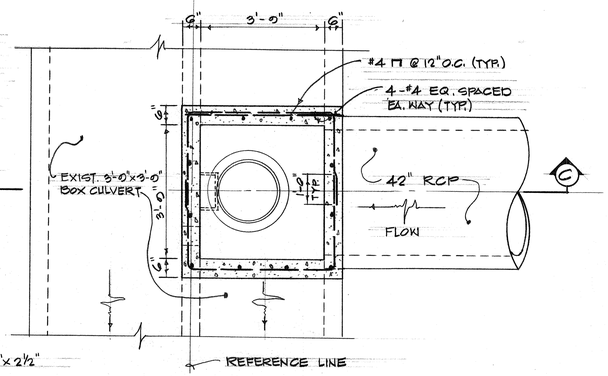
NOTE:
PROVIDE A MINIMUM OF TWO PIPE SUPPORTS FOR THE EXISTING 24" RCP. EXACT LOCATIONS OF THE SUPPORTS SHALL BE AS DETERMINED IN THE FIELD BY THE ENGINEER.




DMH TYPE "S" PLAN
SCALE: ½" = 1'-0"



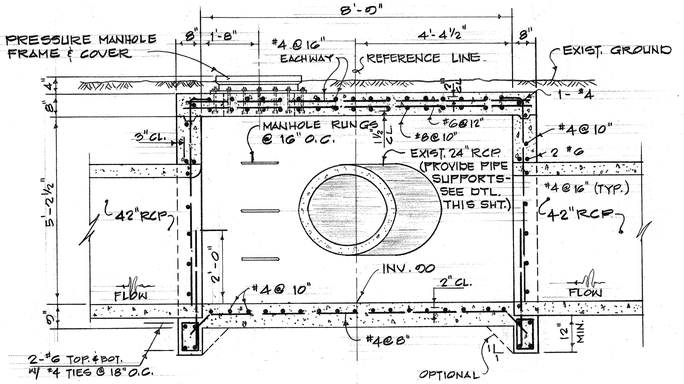

PIPE SUPPORT DETAIL
NOT TO SCALE



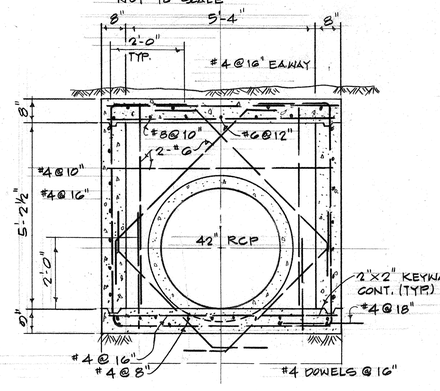

DMH TYPE "P" PLAN
SCALE: ½" = 1'-0"

## GENERAL NOTES:

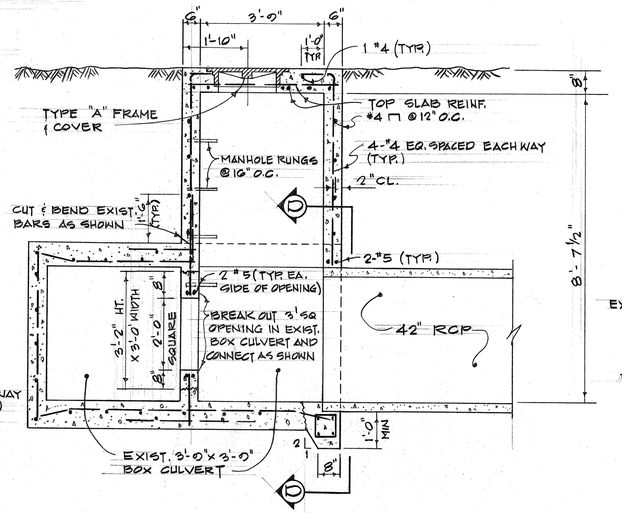
1. ALL CONCRETE SHALL BE CLASS A UNLESS OTHERWISE SPECIFIED.
2. TOP OF DROP INTAKES TO CONFORM TO FINISH GRADE.
3. GENERAL NOTES AND APPLICABLE DETAILS FOR STANDARD DETAILS OF TYPE G1G14 AND G1214 DROP INTAKE WILL APPLY.
4. REINFORCED CONCRETE DATA $f'_c$ = 3000 PSI (28 DAYS) $f_s$ = 20,000 PSI
5. FOR SPLICES NOT DETAILED OVERLAP BAR 24" BAR DIAMETERS OR 12" MINIMUM. STAGGER ALL SPLICES AS APPROVED BY THE ENGINEER.
6. BEND WALL REINFORCEMENT AROUND PIPE CULVERT WHERE NECESSARY.
7. MANHOLE RUNGS SHALL BE INCIDENTAL TO CLASS "A" CONCRETE



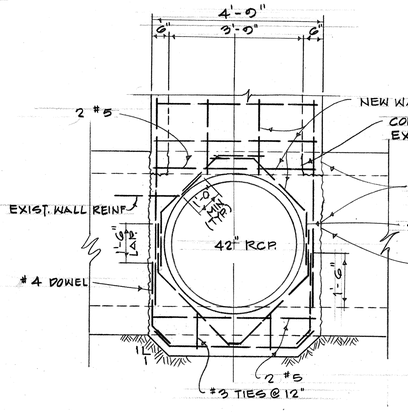

SECTION A-A
SCALE: ½" = 1'-0"



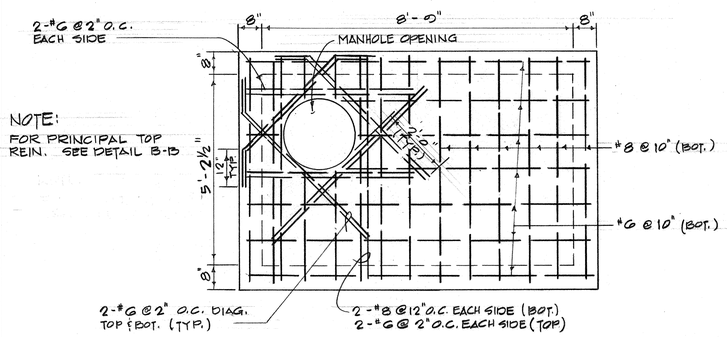

SECTION B-B
SCALE: ½" = 1'-0"



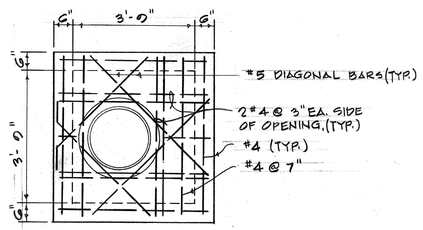

SECTION C-C
SCALE: ½" = 1'-0"




SECTION D-D
SCALE: ½" = 1'-0"




TOP SLAB REINFORCING
SCALE: ½" = 1'-0"




TOP SLAB REINFORCING
SCALE: ½" = 1'-0"

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
NOTE BOOK
QUANTITIES BY
No.
CHECKED BY
DATE

PAUL M. HIROTA
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
NIMITZ SPUR

DRAINAGE DETAILS
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99):15

SCALE: AS NOTED DATE: AUG 4 1976

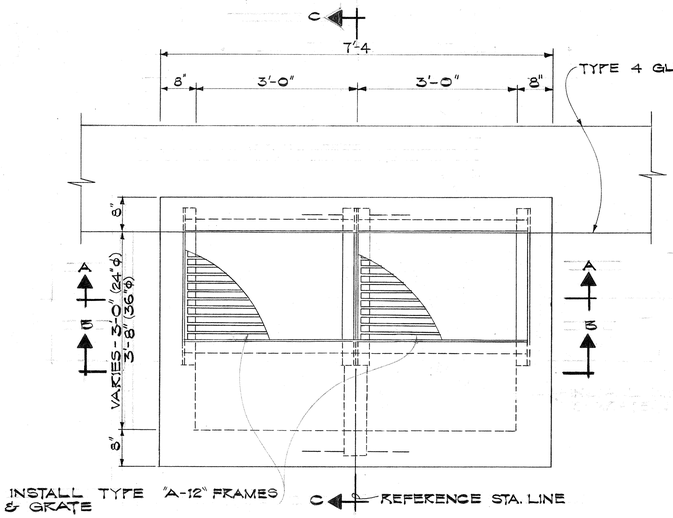
SHEET NO. 9 OF 21 SHEETS

2-7-7

PRINTED ON NO. 1000H CLEARPRINT

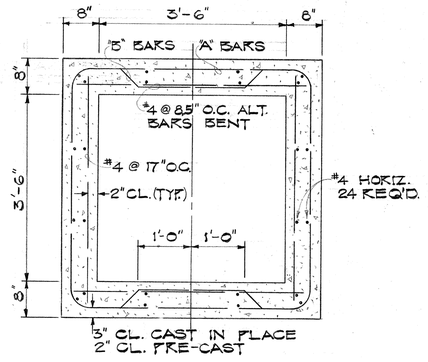
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99):15 | 1977 | 146 | 350 |

SEE SHT. 145 FOR NOTES

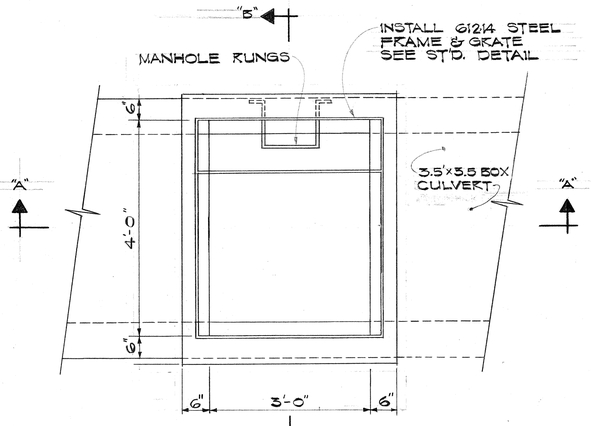



PLAN

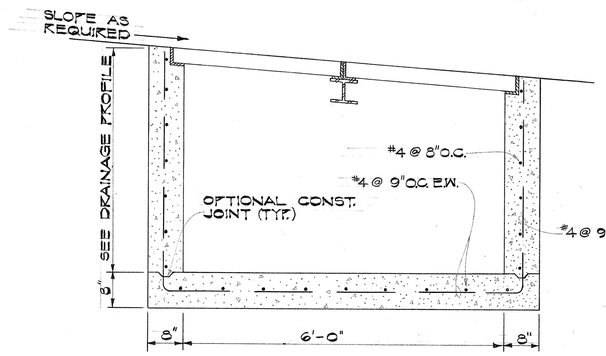

NOTE (FOR BOX DETAIL)
1) ALL LAP SPLICES SHALL BE 20" IN LENGTH.
2) ALL REINF. SHALL HAVE 2" COVER UNLESS SHOWN OTHERWISE.



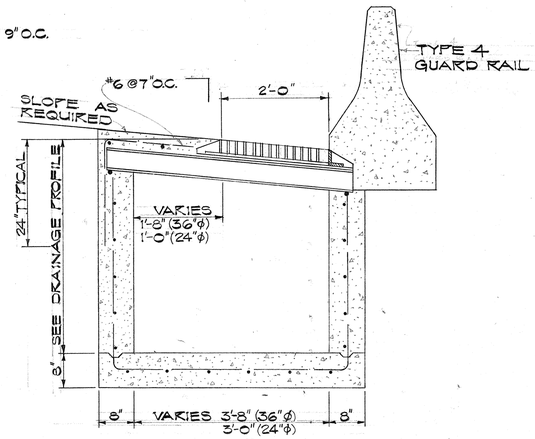

3.5×3.5 BOX CULVERT
SCALE: 3/4" = 1'-0"

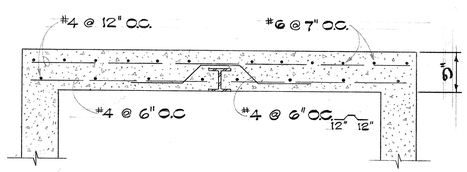



PLAN




SECTION A-A

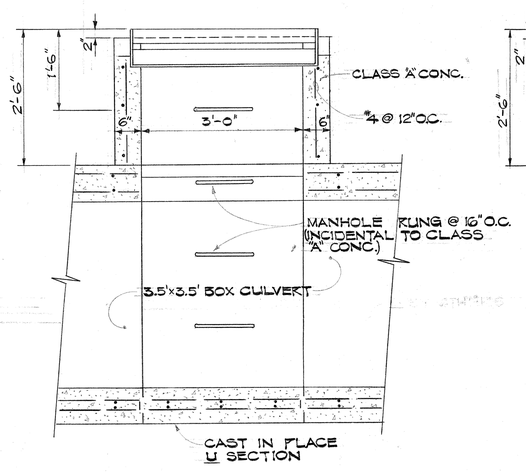


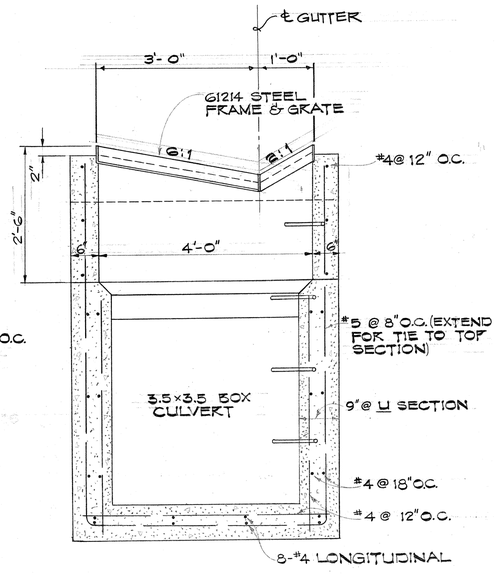

SECTION B-B

SECTION C-C

DROP INTAKE TYPE "L"
SCALE: 3/4" = 1'-0"

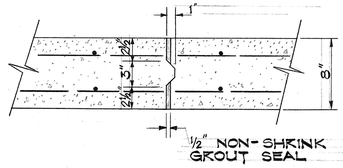



SECTION "A-A"




SECTION "B-B"

DROP INTAKE TYPE "M"
SCALE = 3/4" = 1'-0"




TYPICAL JOINT DETAIL
SCALE: 1½" = 1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NIMITZ SPUR

DRAINAGE DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(99):15

SCALE: AS NOTED DATE: AUG 4 1976

SHEET NO. 10 OF 21 SHEETS

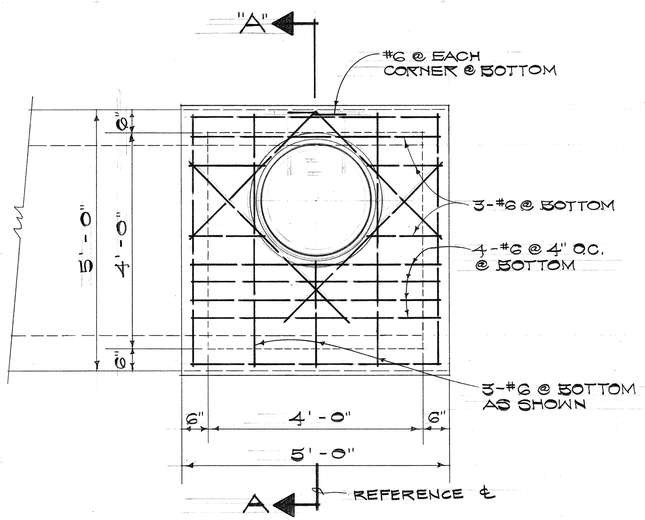
| ORIGINAL PLANS | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| | TRACED BY | |
| NOTE BOOK | DESIGNED BY | |
| | QUANTITIES BY | |
| No. | CHECKED BY | |

2-5-1

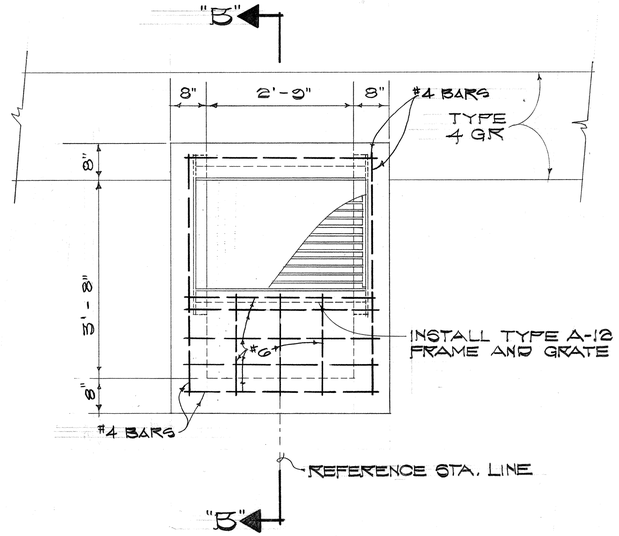
PRINTED ON NO. 1000H CLEARPRINT

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99)15 | 1977 | 147 | 350 |

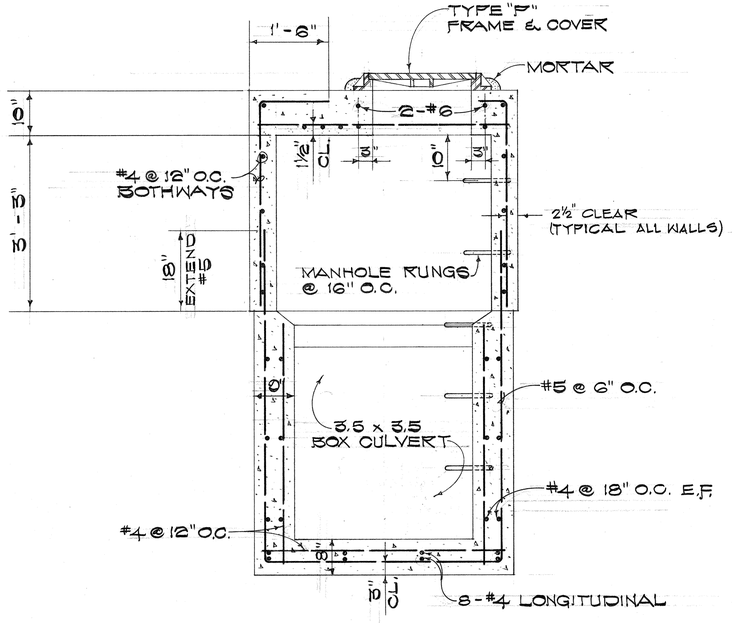
SEE SHT. 145 FOR NOTES




PLAN



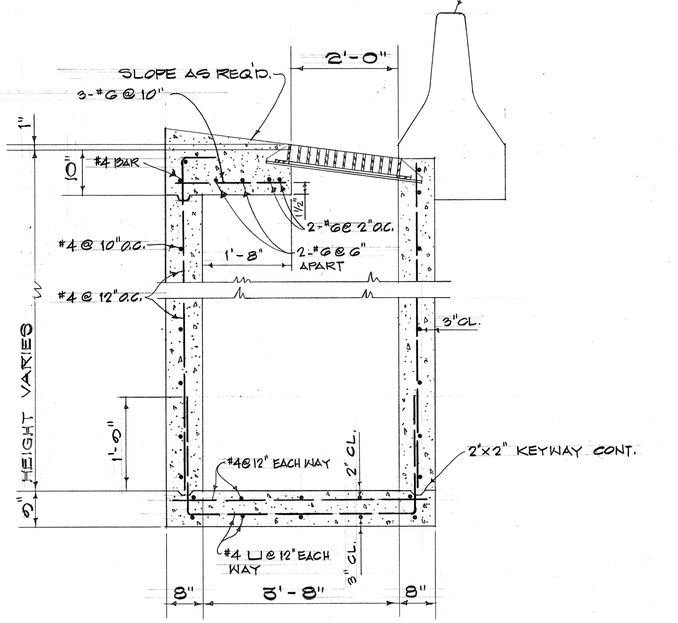

PLAN




SECTION "A-A"

## DRAIN MANHOLE TYPE "N"

SCALE: 3/4" = 1'-0"




SECTION "B-B"

## DROP INTAKE TYPE "K"

SCALE: 3/4" = 1'-0"

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

PAUL M. HIROTA REGISTERED PROFESSIONAL ENGINEER No. 1449 HAWAII, U.S.A.

Paul M. Hirota

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NIMITZ SPUR

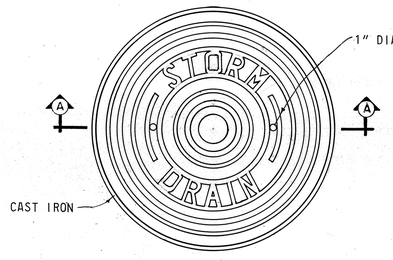
DRAINAGE DETAILS

INTERSTATE ROUTE H-1
PROJECT NO. I-HI-1(99)15

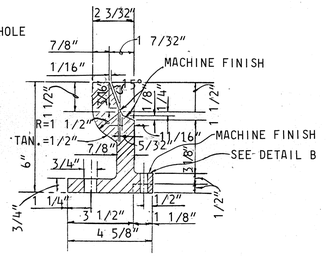
SCALE: AS NOTED DATE: AUG 4 1976

SHEET NO. 11 OF 21 SHEETS

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(99)15 | 1977 | 148 | 350 |

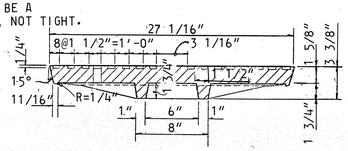



PLAN OF PRESSURE MANHOLE COVER




SECTION E-E

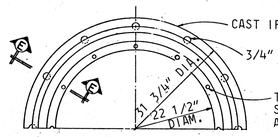
NOTE: COVER TO BE A SNUG FIT, NOT TIGHT.



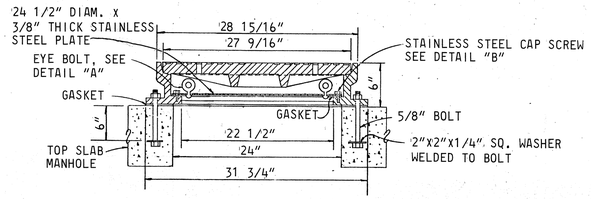

SECTION A-A

NOTES:

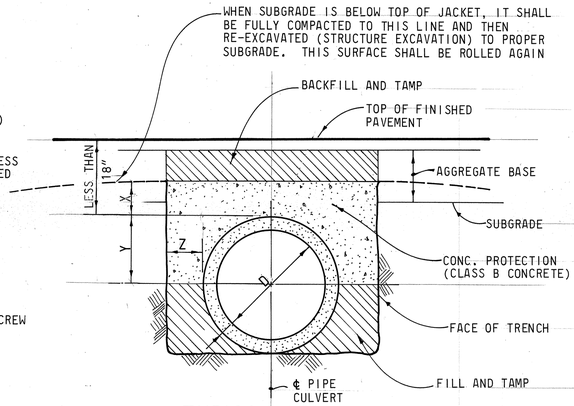
1. GASKETS SHALL BE FROM 1/16 INCH THICK CRANDALL NO. 1906 OR GARLOCK NO. 19.
2. THE PRESSURE PLATE AND CAP SCREWS SHALL BE STAINLESS STEEL ASTM DESIGNATION A240 OR A167, AISI TYPE 318 OR 321.
3. ANCHOR BOLTS SHALL BE SILICON BRONZE ASTM DESIGNATION B98-52.
4. ALL PARTS OF THE MANHOLE FRAME AND COVER AND THE PRESSURE PLATE SHALL BE COATED WITH INERTOL NO. 49.




HALF PLAN-MANHOLE FRAME




SECTION-MANHOLE FRAME & COVER




TYPICAL SECTION

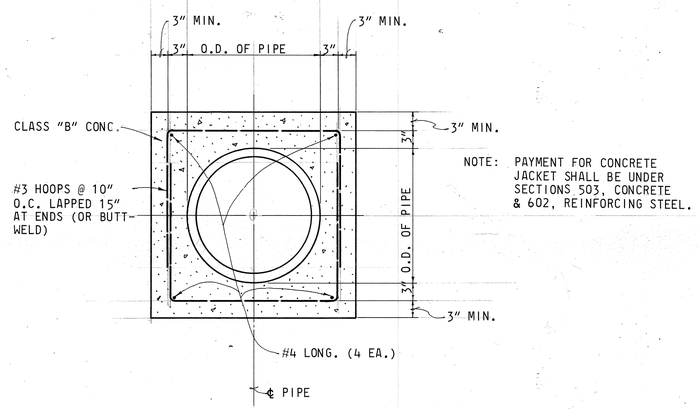
SCALE: 1" = 1'-0"

| DATA FOR CONCRETE PROTECTION OVER CULVERTS | | |
|---|---|---|
| X | Y | Z |
| 6" FOR 18" D | D/2 + T | Z MUST BE FROM PIPE TO FACE OF TRENCH MINIMUM = X MAXIMUM PAY QUANTITY WILL BE Z = 12" |
| 7" FOR 24" D | | |
| 8" FOR 30" D | | |
| 9" FOR 36" D | | |
| 10" FOR 42" D | | |
| 11" FOR 48" D | | |
| 12" FOR 54" D | | |

NOTE:

CONCRETE PROTECTION TO BE USED WHEN COVER IS LESS THAN 18".

# CULVERT CONCRETE PROTECTION DETAIL

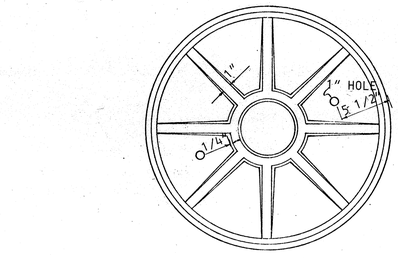



NOTE: PAYMENT FOR CONCRETE JACKET SHALL BE UNDER SECTIONS 503, CONCRETE & 602, REINFORCING STEEL.

DETAIL

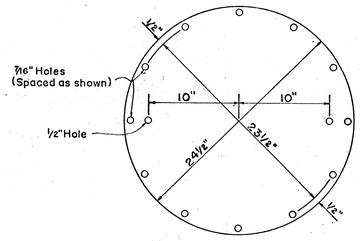
## ⚠1 REINFORCED CONC. JACKET FOR STORM DRAIN PIPE

SCALE: 1" = 1'-0"



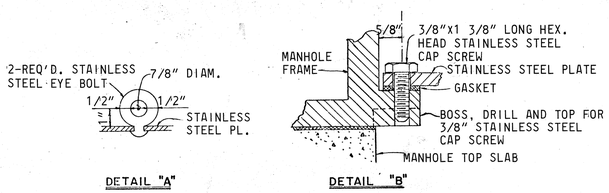

BOTTOM VIEW OF PRESSURE MANHOLE COVER

Not to Scale




PLAN OF PRESSURE PLATE

Not to Scale




| NO. | REVISION | APPR. BY. | DATE |
|---|---|---|---|
| ⚠1 | ADDED REINFORCED CONC. JACKET DETAIL | [illegible] | 6/3/77 |

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

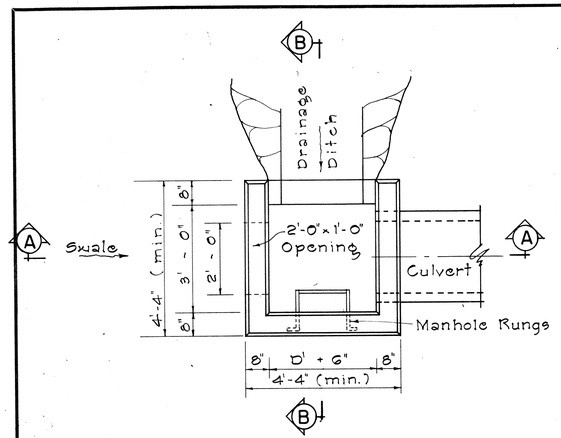
NIMITZ SPUR
MISCELLANEOUS DRAINAGE DETAILS
INTERSTATE ROUTE H-1
PROJ. NO. I-HI-1(99)15

SCALE: AS NOTED DATE: AUG 4 1976

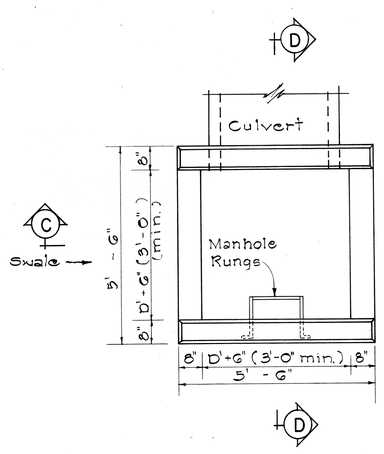
SHEET No. 12 OF 21 SHEETS

ORIGINAL PLAN | NOTE BOOK | NO.
SURVEY PLOTTED BY ____ DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

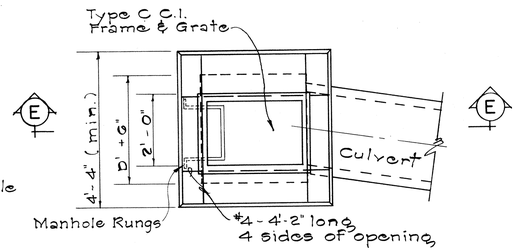
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(22)5 | 1977 | 149 | 350 |



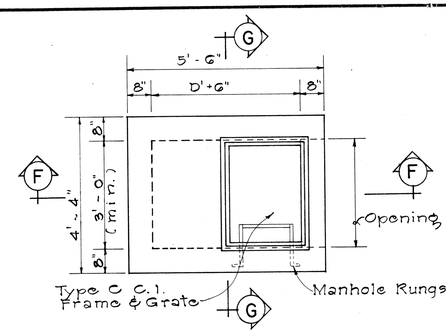

PLAN



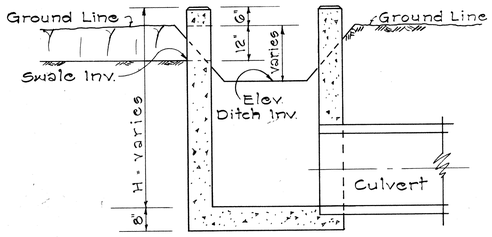

PLAN



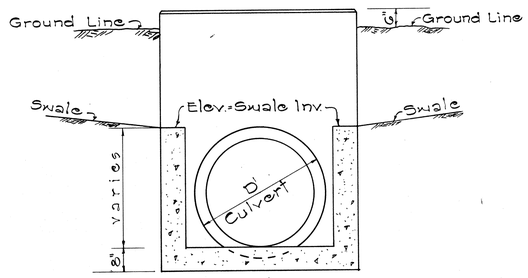

PLAN



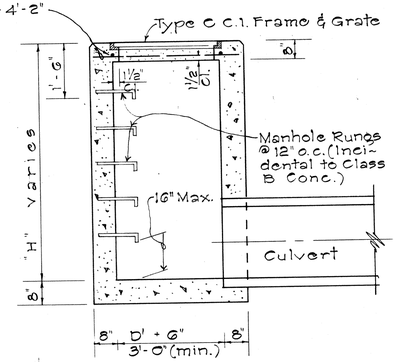

PLAN



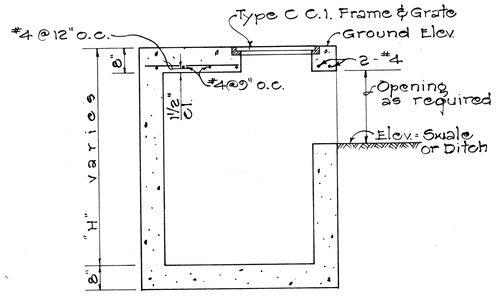

SECTION "A-A"



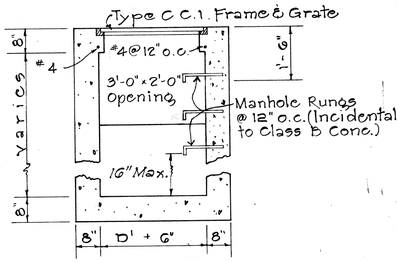

SECTION "C-C"



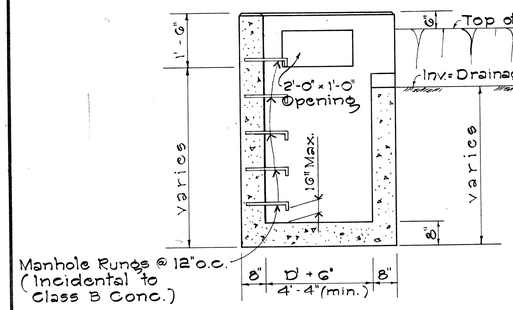

SECTION "E-E"



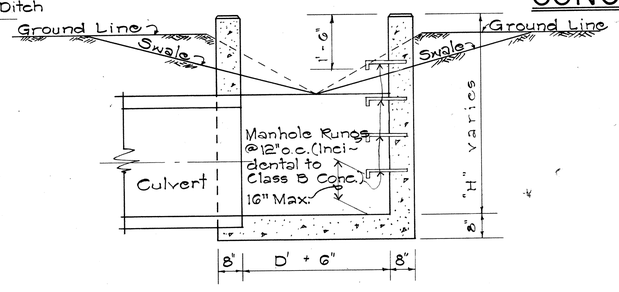

SECTION "F-F"




SECTION "G-G"




SECTION "B-B"




SECTION "D-D"

## GENERAL NOTES

1. All concrete shall be Class "B" unless otherwise noted.
2. Exposed edges of all drainage structures shall be chamfered one inch.
3. Culvert shall enter and leave Drop Intake from any position and in the direction indicated by the plans or ordered by the Engineer.
4. Manhole Rungs (12" o.c.) are req'd. when "H" is greater than 4'-6". Only one rung (16 inches from the bottom) is required if "H" is 4'-6" or less. Manhole Rungs maybe placed at any location as ordered by the Engineer.

# TYPE "A" CONCRETE DROP INTAKE

Scale: 1/2" = 1'-0"

# TYPE "B" CONCRETE DROP INTAKE

Scale: 1/2" = 1'-0"

# TYPE "C" GRATED CONCRETE DROP INTAKE

Scale: 1/2" = 1'-0"

# TYPE "D" GRATED CONCRETE DROP INTAKE

Scale: 1/2" = 1'-0"

APPROVAL RECOMMENDED: R. Takamo — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED: [signature] — ASSISTANT CHIEF, ENGINEERING — 12-17-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Spacing on Manhole Rungs to conform to OSHA. | H.I. | 1-21-75 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
TYPE "A", "B", "C", AND "D"
CONCRETE DROP INTAKE

Scale: As Noted — Date: July, 1969

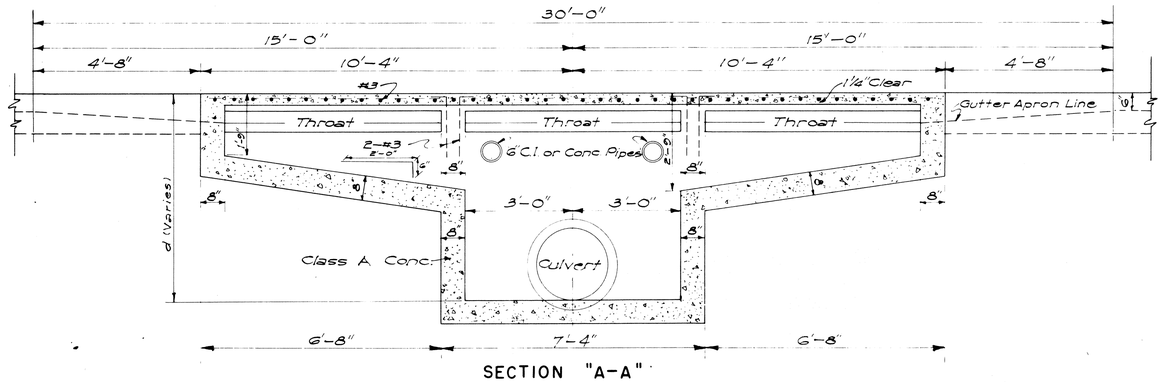
SHEET No. 13 OF 21 SHEETS DH19

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

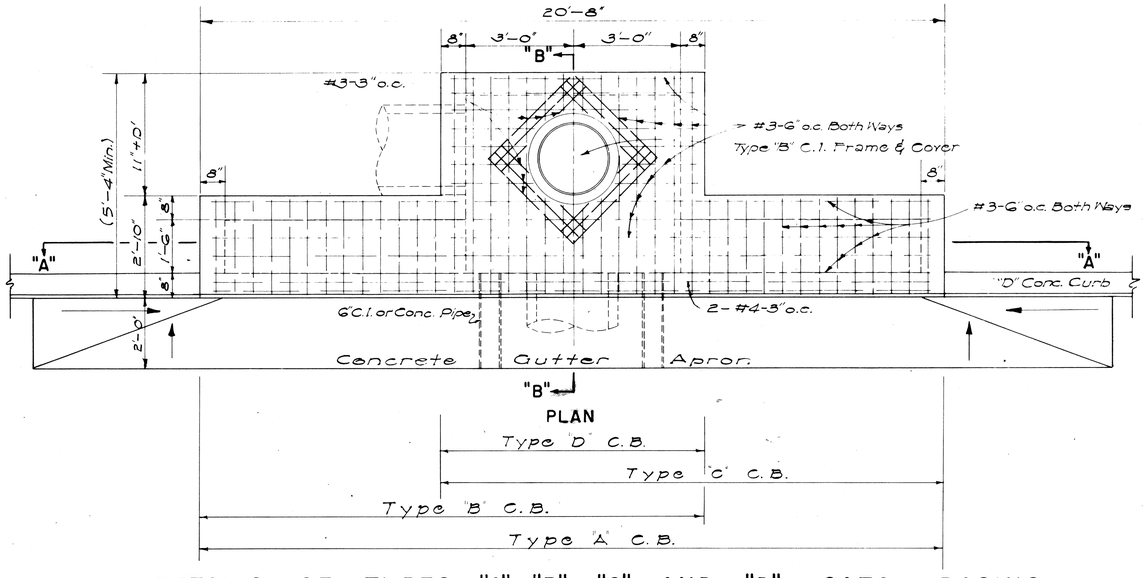
C-5-7

2/17/69

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(55)5 | 1977 | 150 | 350 |



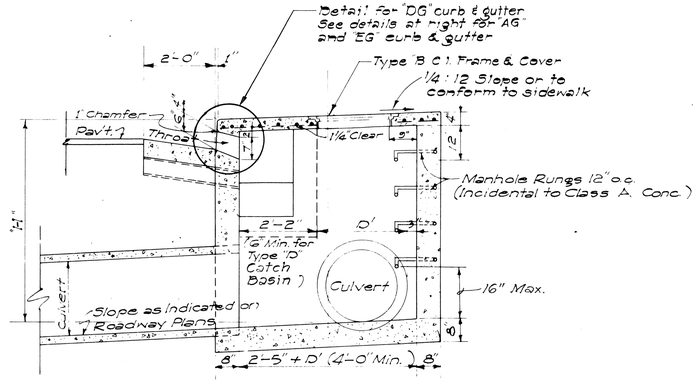

SECTION "A-A"



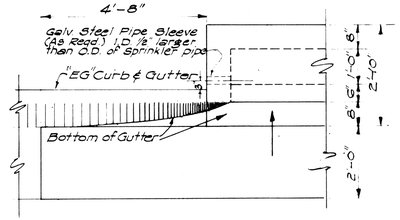

PLAN

## DETAILS OF TYPES "A", "B", "C" AND "D" CATCH BASINS

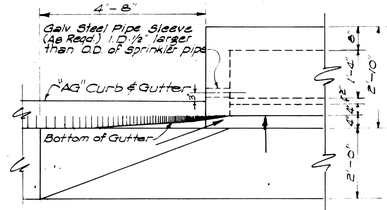
SCALE: 1/2" = 1'-0"




SECTION "B-B"

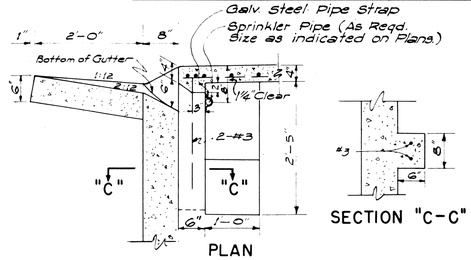



## DETAIL OF CATCH BASIN WITH "EG" CURB & GUTTER




## DETAIL OF CATCH BASIN WITH "AG" CURB & GUTTER

SCALE: 1/2" = 1'-0"

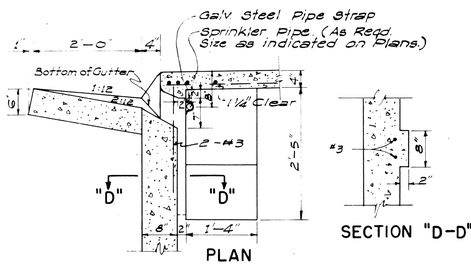



PLAN

SECTION "C-C"

## THROAT DETAIL FOR "EG" CURB & GUTTER

SCALE: 3/4" = 1'-0"




PLAN

SECTION "D-D"

## THROAT DETAIL FOR "AG" CURB & GUTTER

SCALE: 3/4" = 1'-0"

## GENERAL NOTES

1. Quantities based on d' = 5.75' and D' = 30".
2. Quantities do not include concrete for Gutter Apron.
3. The Contractor shall install two 6" Cast Iron or Concrete Pipes as incidental to Class A Concrete for Construction Drainage. The Engineer shall determine the exact location in the field.
4. Culvert shall leave C.B. from any position and any direction indicated by plans or ordered by the Engineer. Culvert may both enter and leave C.B. so that C.B. will also act as Manhole.
5. The Contractor shall install Galvanized Steel Pipe Sleeves and Straps as incidental to Sprinkler System.
6. The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
7. Manhole Rungs (12" o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Type "B" Cast Iron Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

## ESTIMATED QUANTITIES

| Type | Class A Conc. | Struct. Exc. | Reinf. Steel | Gutter Length |
|---|---|---|---|---|
| "A" | 7.5 c.y. | 24.7 c.y. | 145 lb. | 30'-0" |
| "B" | 6.0 c.y. | 21.5 c.y. | 108 lb. | 23'-4" |
| "C" | 6.0 c.y. | 21.5 c.y. | 108 lb. | 23'-4" |
| "D" | 4.9 c.y. | 16.5 c.y. | 77 lb. | 16'-8" |

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Spacing on Manhole Rungs to conform to OSHA. | H.T. | 1-21-75 |

APPROVAL RECOMMENDED:
G. Takara — 12-17-69
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:
William E. Bolton — 12-17-69
ASSISTANT CHIEF, ENGINEERING — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
CATCH BASINS

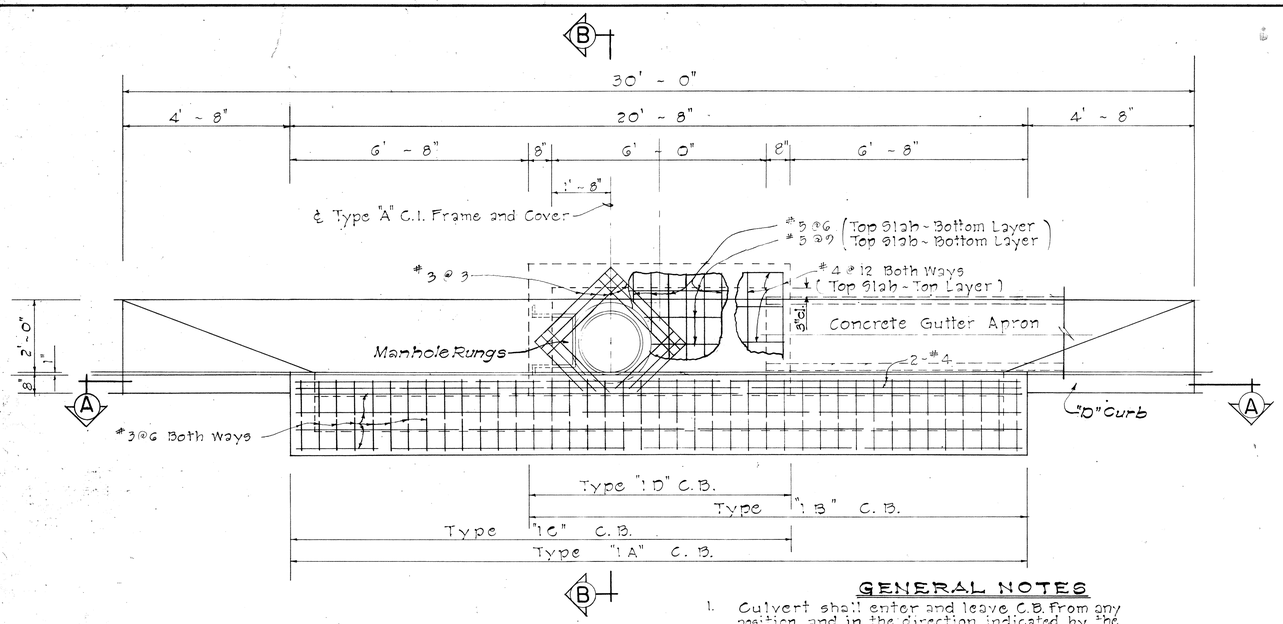
Scale: As Noted — Date: July, 1969

SHEET NO 14 OF 21 SHEETS DH 1

| ORIGINAL PLAN | SURVEY PLOTTED BY: | DATE |
|---|---|---|
| NOTE BOOK | DESIGNED BY: C.M. | |
| No. | DRAWN BY: C.Y. | |
| | TRACED BY: | |
| | QUANTITIES BY: | |
| | CHECKED BY: | |

C-V-7

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(80)15 | 1977 | 151 | 350 |

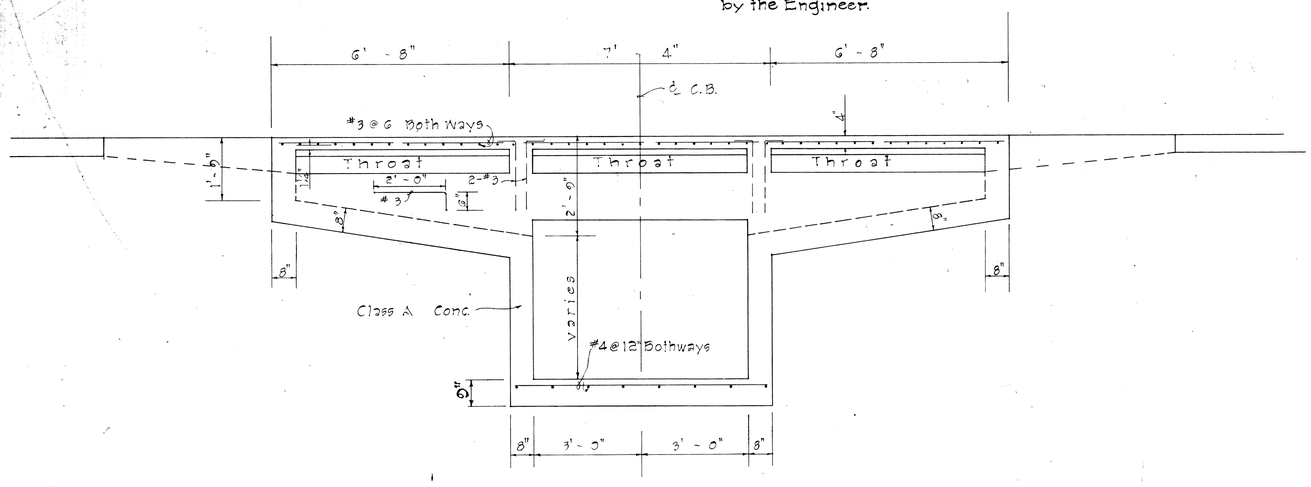



## PLAN

Scale: 1/2" = 1' - 0"

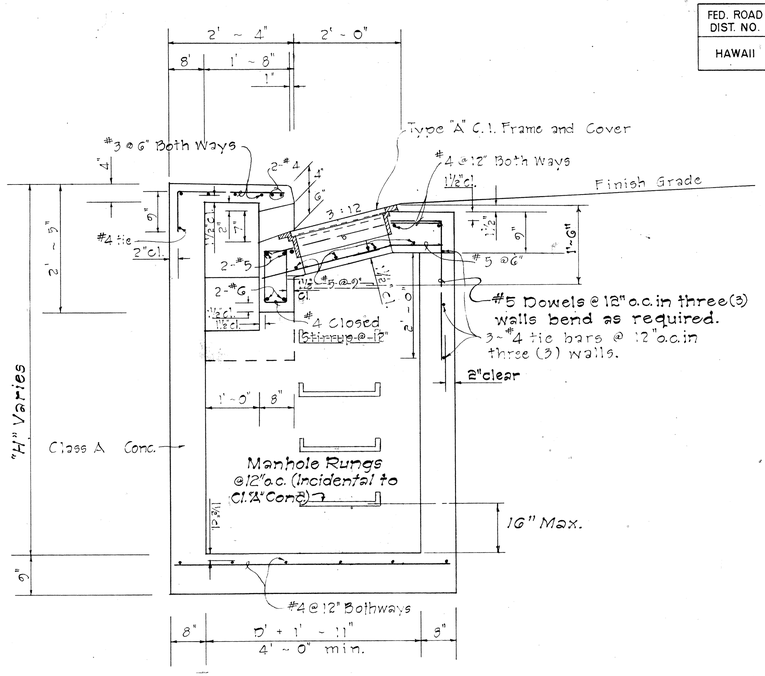
## GENERAL NOTES

1. Culvert shall enter and leave C.B. from any position and in the direction indicated by the plans or ordered by the Engineer.
2. 'D' shall be the maximum outside dimension of the culvert at the C.B. wall.
3. The type of curb and/or gutter (Type 1, 2, 3, etc.) shall conform to the type specified on the roadway plans.
4. Manhole Rungs (12"o.c) are required when "H" is greater than 4 feet 6inches. Only one rung (16inches from the bottom) is required if "H" is 4 feet 6inches or less. Type "A" C.I. Frame & Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.




## SECTION "A-A"

Scale: 1/2" = 1' - 0"




## SECTION "B-B"

Scale: 3/4" = 1' - 0"

# DETAILS OF TYPE "IA", "IB", "IC" AND "ID" CATCH BASIN

APPROVAL RECOMMENDED:

P. Takano — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:

ASSISTANT CHIEF, ENGINEERING — 12-17-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Spacing on Manhole Rungs to conform to OSHA. | H.T. | 1-21-75 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE "IA", "IB", "IC", AND "ID" CATCH BASINS

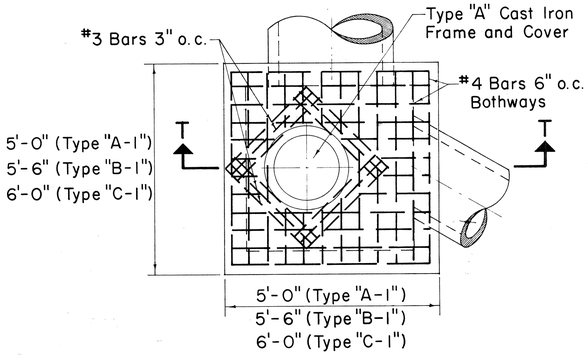
Scale: As Noted — Date: July, 1969

SHEET No. 15 OF 21 SHEETS DH 3

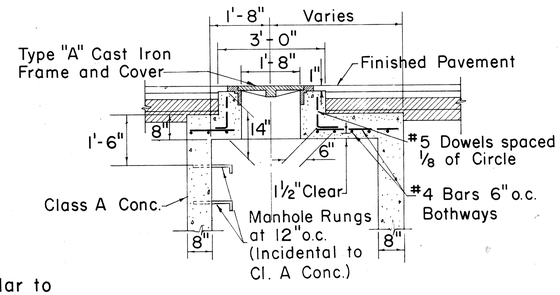
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| | DRAWN BY | |
| | TRACED BY | |
| NOTE BOOK | DESIGNED BY | |
| No. | QUANTITIES BY | |
| | CHECKED BY | |

C-3-7

| FED. ROAD DIST. NO. | STATE | FED. AID. PROJECT | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAWAII | I-HI-1(69)15 | 1977 | 152 | 350 |




PLAN

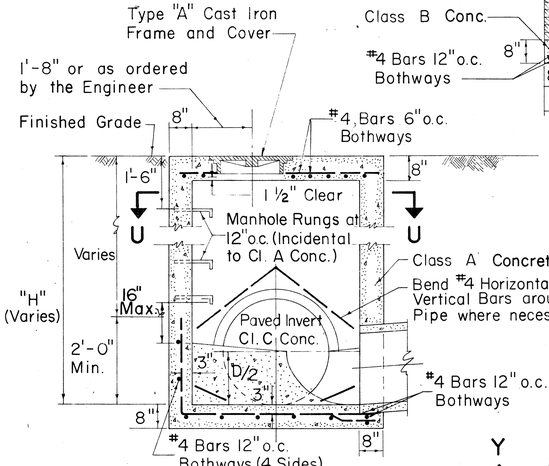



SECTION T-T

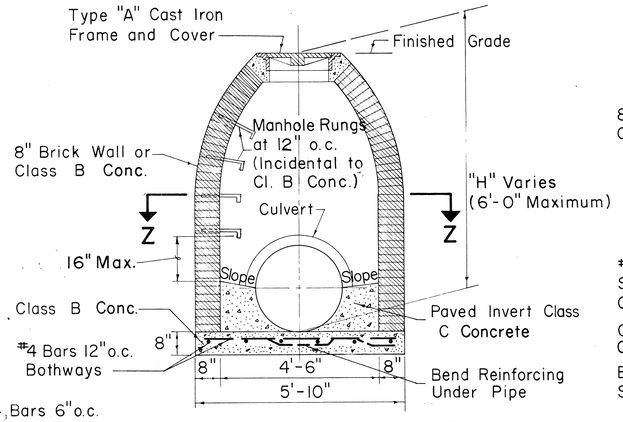
Note:
Bottom detail similar to Type "A", "B", & "C".

# TYPE "A-1", "B-1", & "C-1" STORM DRAIN MANHOLE TOP DETAIL UNDER PAVEMENT

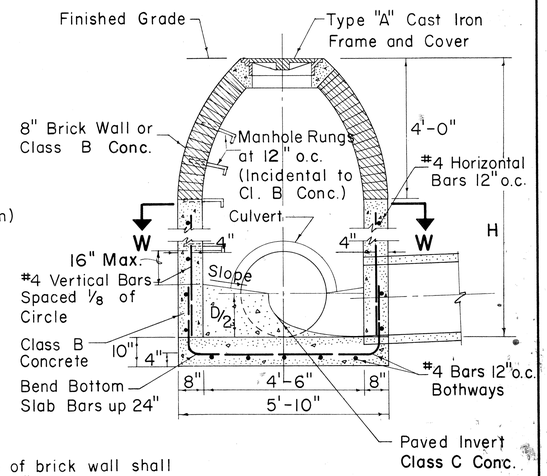
Scale: ½"= 1'-0"




SECTION V-V



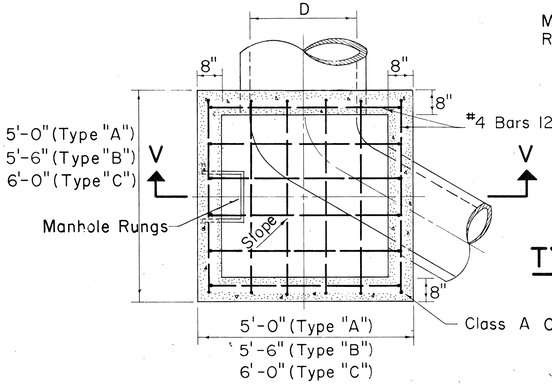

SECTION Y-Y




SECTION X-X

NOTE:

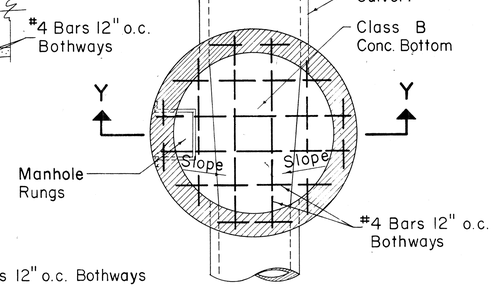
1. Exterior surface of brick wall shall be plastered with 1" thickness of 1:2 Cement Mortar.
2. Number, size and direction of culvert at manhole to be as shown on plans.
3. Paved invert not required at drop manholes.
4. All Class C Concrete to be incidental to Class B Concrete.




SECTION U-U

# TYPE "A", "B", & "C" S.D.M.H.

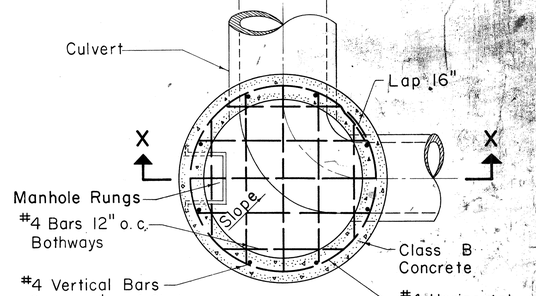
Scale: ½"= 1'-0"




SECTION Z-Z

# TYPE "D" STORM DRAIN MANHOLE

Scale: ½"= 1'-0"




SECTION W-W

# TYPE "E" STORM DRAIN MANHOLE

Scale: ½"= 1'-0"

GENERAL NOTES

1. Culvert shall enter and leave S.D.M.H. from any position and in the direction indicated by the plans or ordered by the Engineer.
2. Manhole Rungs (12"o.c.) are required when "H" is greater than 4'-6". Only one rung (16" from the bottom) is required if "H" is 4'-6" or less. Type "A" C.I. Frame and Cover and Manhole Rungs may be placed at any location as ordered by the Engineer.

APPROVAL RECOMMENDED:
L. Takano — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:
Glenn Boddie — ASS'T. CHIEF, ENGINEERING — 12-17-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Spacing on Manhole Rungs to conform to OSHA. | H.T. | 1-21-75 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

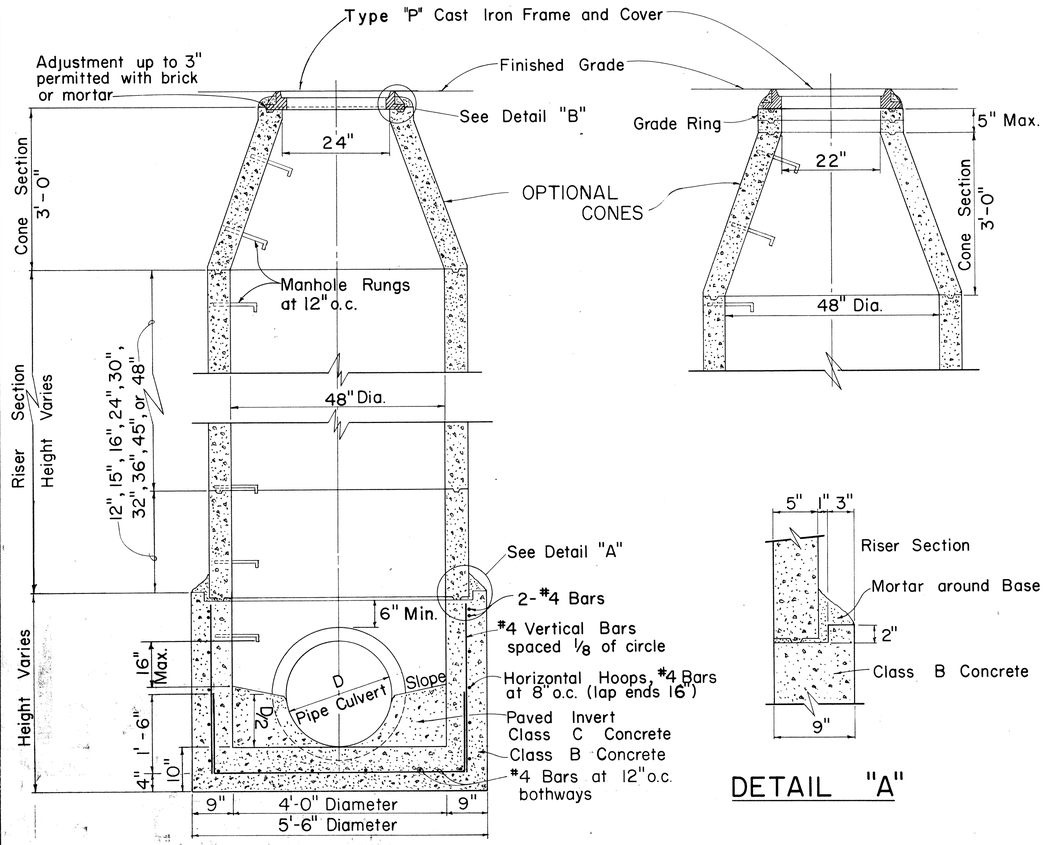
STORM DRAIN MANHOLES

Scales: As Noted — Date: July, 1969

SHEET NO. 16 OF 21 SHEETS DH 5

152

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(69)15 | 1977 | 153 | 350 |

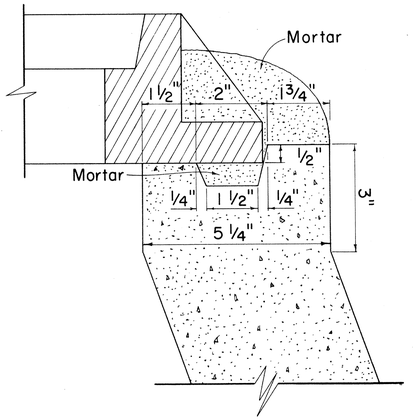



## TYPICAL SECTIONS PRECAST CONCRETE MANHOLE

Not to Scale

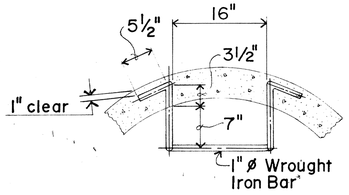



## DETAIL "A"

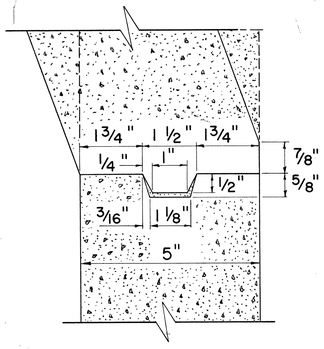



## DETAIL "B"

Not to Scale

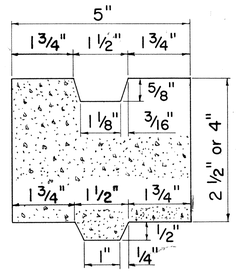



## PLAN VIEW



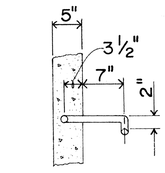

## DETAIL FOR RISER JOINTS

Not to Scale

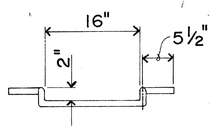



## GRADE RING DETAIL

Not to Scale




## SIDE VIEW




## FRONT VIEW

## DETAIL OF MANHOLE RUNGS

Not to Scale

## GENERAL NOTES

1. Manhole Rungs to be placed at 12"o.c. (Manhole Rungs incidental to Class B Concrete)
2. Select appropriate combination of risers and grade rings for required height.
3. All joints to be grouted as set.
4. The precast sections shall be constructed in accordance with the details shown on the plans and to the requirements of ASTM C 478
5. Manufacturers may submit to the Engineer for approval, prior to manufacturing, designs other than those shown on this sheet.
6. Reinforcing steel for precast sections shall be placed in accordance with the requirements of ASTM C 478
7. All Class C Concrete to be incidental to Class B Concrete.

APPROVAL RECOMMENDED:

G. Takano — 2-2-71
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

[signature] — 2-25-71
ASSISTANT CHIEF, ENGINEERING — DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Spacing and details of Manhole Rungs to conform to OSHA | H.T. | 2/25/76 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

# STANDARD DETAILS
# PRECAST CONCRETE STORM DRAIN MANHOLES

Not to Scale — Date: Nov., 1970

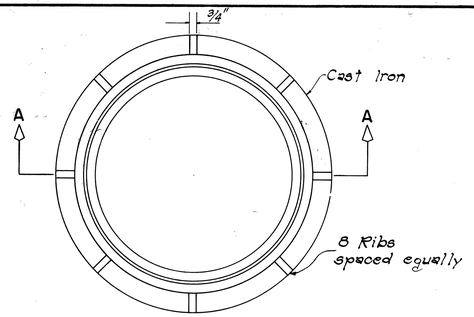
SHEET No. 17 OF 21 SHEETS DH 5A

153

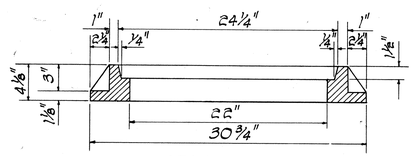
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE | NOTE BOOK | No.

6-3-7

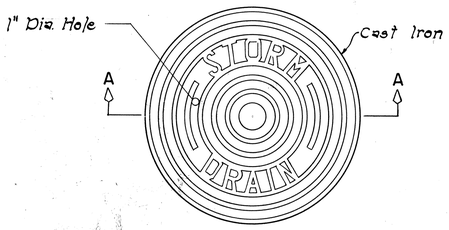
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-(69)15 | 1977 | 154 | 350 |



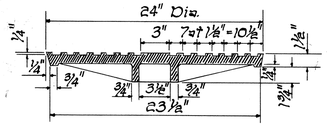

PLAN



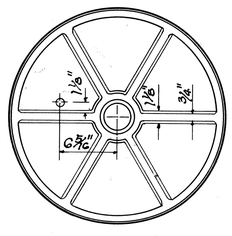

SECTION A-A




PLAN




SECTION A-A

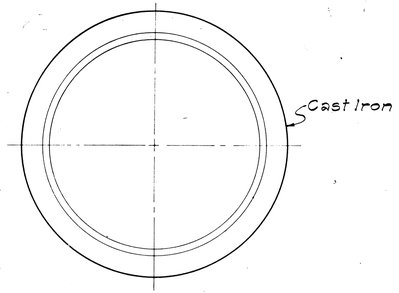



BOTTOM VIEW OF COVER

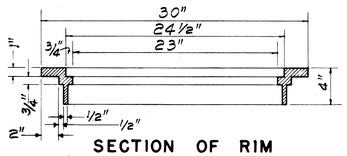
DETAILS OF TYPE "P"

CAST IRON FRAME AND COVER

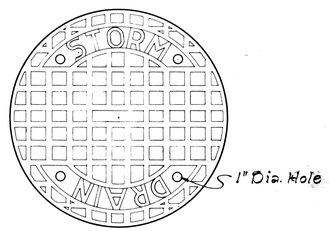
SCALE : 1-1/2" = 1'-0"



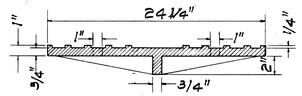

PLAN OF RIM



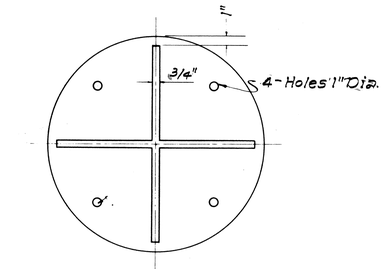

SECTION OF RIM




TOP VIEW OF COVER




SECTION

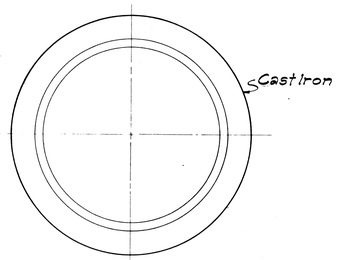



BOTTOM VIEW OF COVER

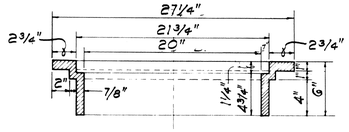
DETAILS OF TYPE "B"

CAST IRON FRAME AND COVER

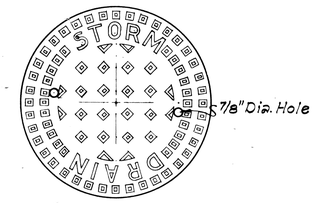
SCALE : 1-1/2" = 1'-0"



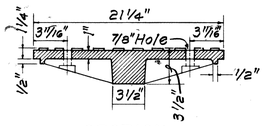

PLAN OF RIM



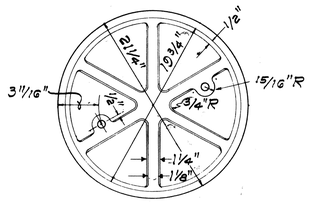

SECTION OF RIM




TOP VIEW OF COVER




SECTION

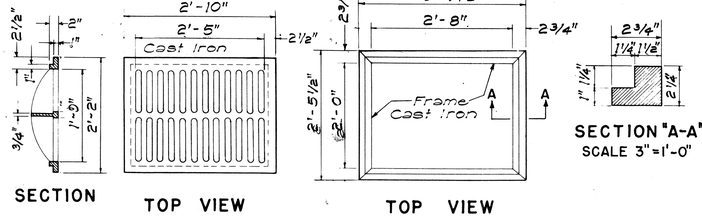



BOTTOM VIEW OF COVER

DETAILS OF TYPE "A"

CAST IRON FRAME AND COVER

SCALE : 1-1/2" = 1'-0"

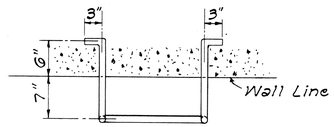



SECTION TOP VIEW TOP VIEW

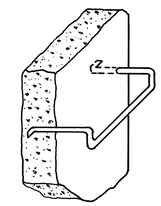
SECTION "A-A"
SCALE 3" = 1'-0"

TYPE C C.I. FRAME AND GRATE

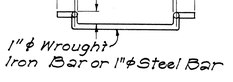
SCALE: 3/4" = 1'-0"




PLAN



PICTORIAL VIEW
NOT TO SCALE




FRONT VIEW


SIDE VIEW

DETAILS OF MANHOLE RUNG

SCALE : 1"= 1'-0"

APPROVAL RECOMMENDED:
G. Takara — HYDRAULIC DESIGN ENGINEER — 12-17-69 DATE

APPROVED:
Edward R. Sakai — ASSISTANT CHIEF, ENGINEERING — 12-19-69 DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1. | Detail of Type "P" Cast Iron Frame and Cover | H.T. | 1-6-71 |
| 2 | Details of Manhole Rungs to conform to OSHA. | H.T. | 1-21-75 |
| 3 | Option for Manhole Rungs | H.T. | 1-13-76 |

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CATCH BASIN AND MANHOLE CASTINGS

Scale: As Noted — Date: July, 1969

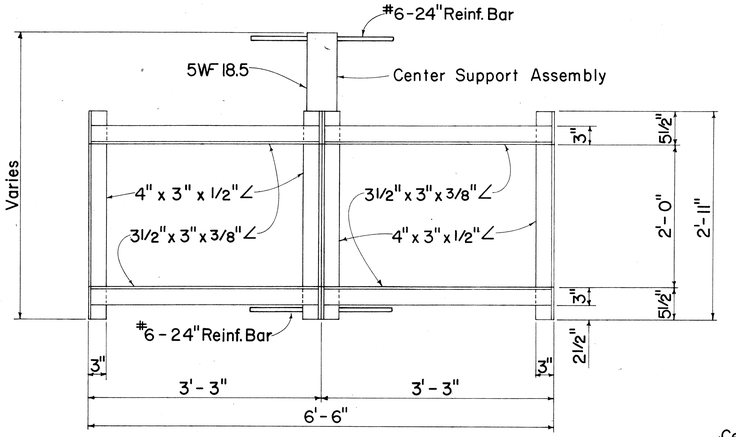
SHEET Nº 18 OF 21 SHEETS DH 6

154

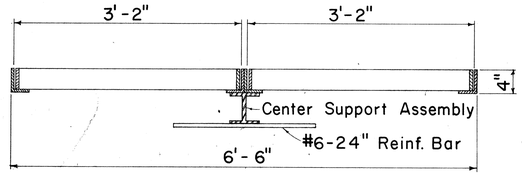
ORIGINAL PLAN | NOTE BOOK No.
SURVEY PLOTTED BY: DATE
SURVEYED BY:
DRAWN BY:
TRACED BY: A. Calistro
QUANTITIES BY:
CHECKED BY:

TRACING CLOTH

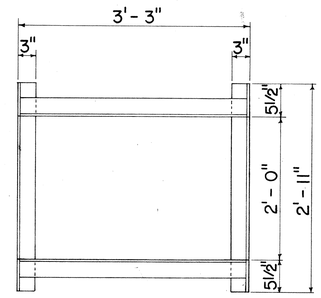
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(20)15 | 1977 | 155 | 350 |



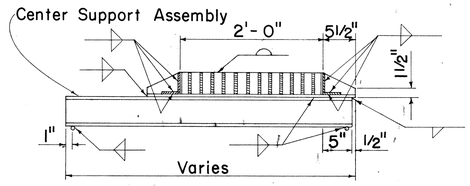

PLAN
(Two or More Grates)




LONGITUDINAL SECTION
(Thru Frame & Grate)



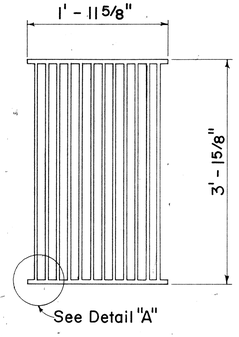

PLAN
(Single Grate)



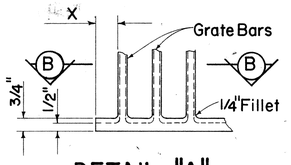

CROSS SECTION
(Thru Frame & Grate)

## FRAME DETAILS

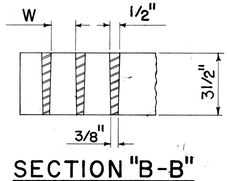
Scale: 1"= 1'-0"




PLAN
Scale: 1"= 1'-0"

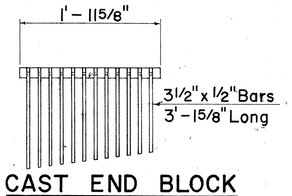



DETAIL "A"
Scale: 3"= 1'-0"

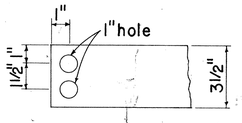



SECTION "B-B"
Scale: 3"= 1'-0"

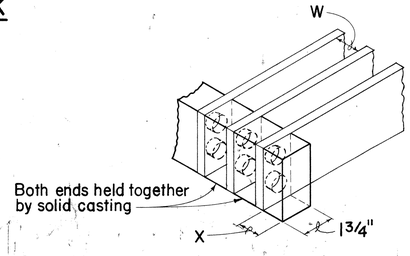
ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL GRATE



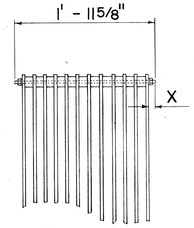

CAST END BLOCK
Scale: 1"= 1'-0"



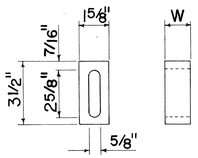

END OF BAR
Scale: 3"= 1'-0"



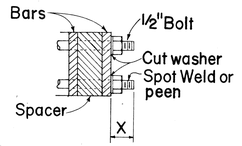

ALTERNATIVE CAST MALLEABLE IRON
OR CAST STEEL END BLOCK GRATE



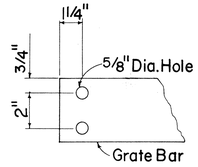

BOLTED END BLOCK
Scale: 1"= 1'-0"




BAR SPACER
Scale: 3"= 1'-0"

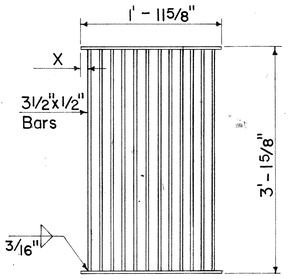


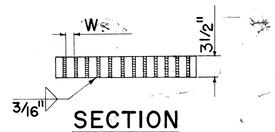

BOLTING DETAIL
Scale: 3"= 1'-0"




END OF BAR
Scale: 3"= 1'-0"

## ALTERNATIVE BOLTED GRATE




SECTION

PLAN
ALTERNATIVE WELDED GRATE
Scale: 1"= 1'-0"

## GENERAL NOTES

1. Contractor has the option of using cast malleable iron, cast steel, welded, bolted, cast malleable iron end block or cast steel end block grate.
2. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
3. All welds 3/8" unless otherwise noted.
4. Center support assembly shall be used when two or more grates are specified. Incidental to Types A-9 or A-12 Frame and Grates.
5. Refer to "Grate Bar Spacing Table" for Types A-9 and A-12 Grate dimensions.
6. The various materials shall conform to the specifications of ASTM as listed in the following tabulation and the Std. Specifications.

| Material | ASTM Designation |
|---|---|
| Structural Steel | A283, Grade D |
| Cast Steel | A27, Grade 65-35 |
| Malleable Iron Casting | A47, Gr. No. 35018 |

GRATE BAR SPACING TABLE

| TYPE | NO. BARS | CLEAR BAR SPACING - W | X |
|---|---|---|---|
| A-9 | 9 | 2" | 1 9/16" |
| A-12 | 12 | 1 3/8" | 1 1/4" |

NOTE:

1. Type A-9 – Use in locations off the roadbed on all types of highways.
2. Type A-12 – Use within the roadbed on all types of highways.

APPROVAL RECOMMENDED:
H. Takano — 12-17-69
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:
Rudolph R. Rodrigues — 12-17-69
ASSISTANT CHIEF, ENGINEERING — DATE

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| | | | |

Scale: 1"= 1'-0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

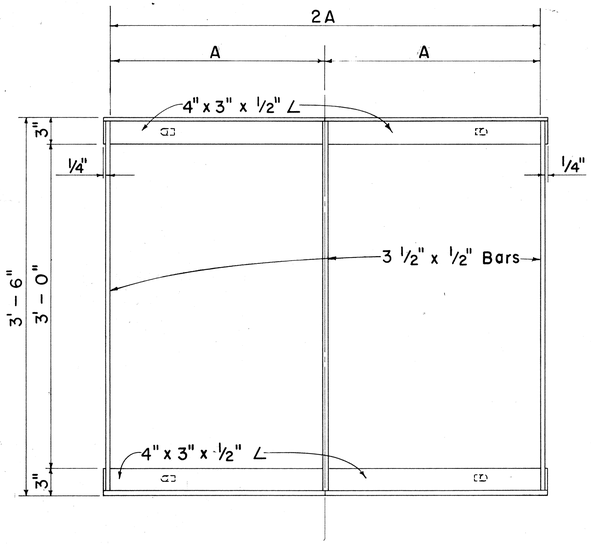
TYPE A-9 AND A-12
FRAMES AND GRATES

Scales: As Noted — Date: Aug. 1968

SHEET No. 19 OF 21 SHEETS DH 7

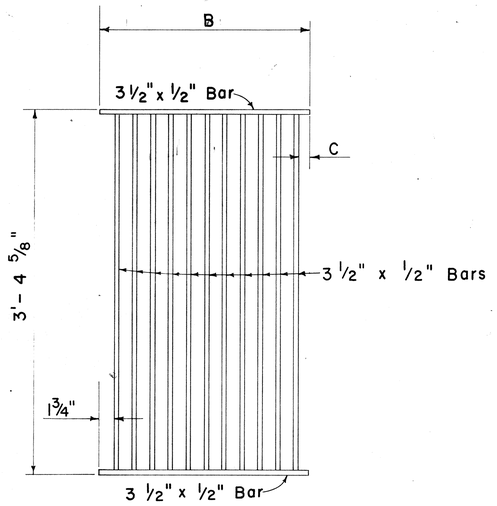
| ORIGINAL PLAN | | DATE |
|---|---|---|
| | SURVEY PLOTTED BY | |
| | DRAWN BY L.C.A.T. | 7/68 |
| | TRACED BY L.C.A.T. | 8/68 |
| | DESIGNED BY H.K.M. | 7/68 |
| NOTE BOOK | QUANTITIES BY | |
| No. | CHECKED BY H.K.M. | 8/68 |

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | I-HI-1(69)15 | 1977 | 156 | 350 |



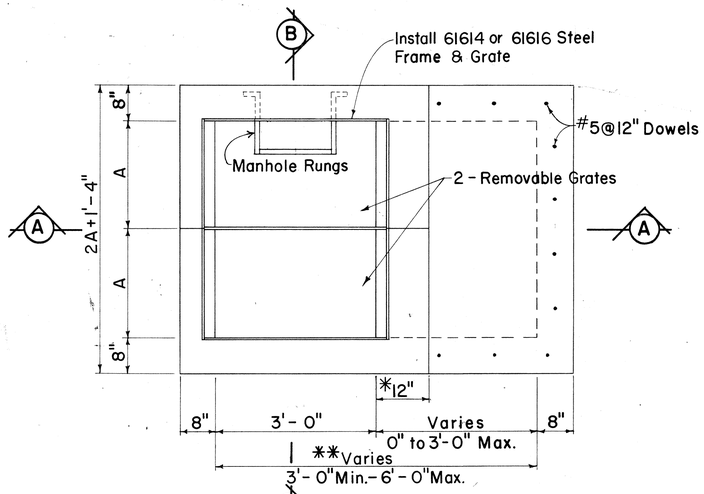

PLAN

Scale: 1 1/2" = 1'-0"

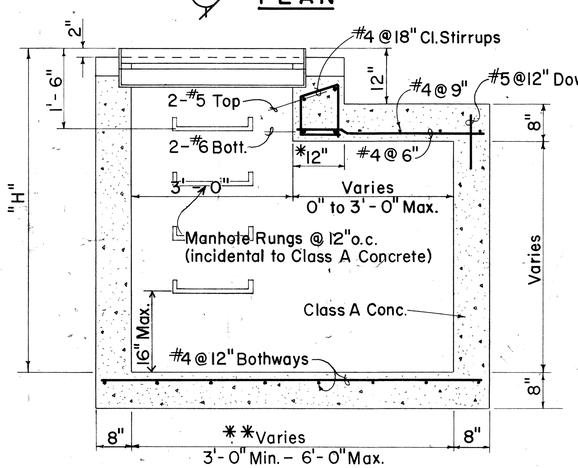



PLAN

Scale: 1 1/2" = 1'-0"




PLAN




SECTION A-A




Install curb when Drop Intake is used to drain Top of Fill Gutters. Provide Gutter Transitions of 25 ft. (entering and leaving D.I.)

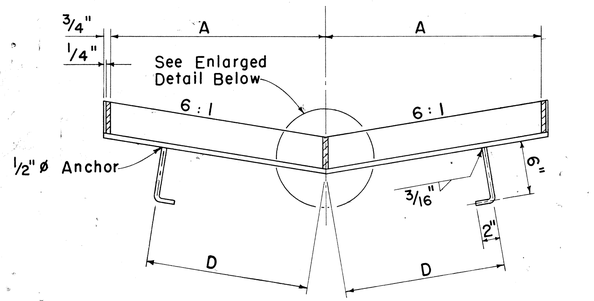
SECTION B-B

## DETAILS OF 61614 OR 61616 DROP INTAKE

Scale: 3/4" = 1'-0"

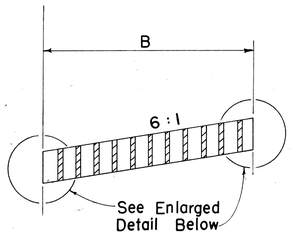
*For Minimum size box of 3'-0", use 8" and eliminate reinforcing steel shown in the top portion.

**For Culverts larger than 30", the minimum dimension shall be D'.



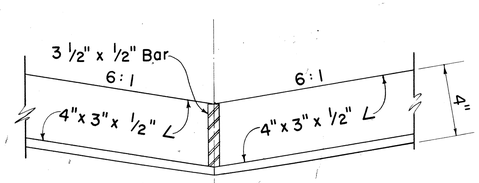

SECTION

Scale: 1 1/2" = 1'-0"



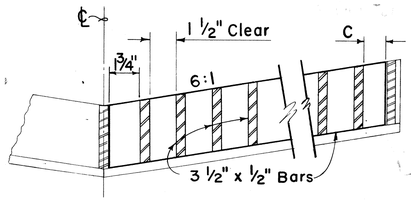

SECTION

Scale: 1 1/2" = 1'-0"




FRAME

Scale: 3" = 1'-0"




GRATE

Scale: 3" = 1'-0"

## DETAILS OF TYPE 61614 OR 61616 STEEL FRAME AND GRATE

## GENERAL NOTES

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds 3/8" unless otherwise noted.
3. Refer to "Spacing Table" for Types 61614 & 61616 Drop Intake and Frame & Grates dimensions.
4. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
5. Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.
6. Manhole Rungs (12"o.c.) are required when "H" is greater than 4 feet 6 inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. Manhole Rungs may be placed at any location as ordered by the Engineer.

## SPACING TABLE

| TYPE | NO. BARS | A | B | C | D |
|---|---|---|---|---|---|
| 61614 | 11 | 2'-0" | 1'-11 1/2" | 1/4" | 1'-6" |
| 61616 | 17 | 3'-0" | 2'-11 3/8" | 1/8" | 2'-0" |

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1 | Curb for Top of Fill Gutters | H.T. | 6-5-71 |
| 2 | Spacing on manhole rungs to conform to OSHA. | H.T. | 1-21-75 |

APPROVAL RECOMMENDED:

Y. Takano — 12-17-69

HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:

[signature] — 12-17-69

ASSISTANT CHIEF, ENGINEERING — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

TYPE 61614 & 61616
GRATED DROP INTAKES

Scales: As Noted — Date: Feb. 1969

SHEET No. 80 OF 21 SHEETS DH 8

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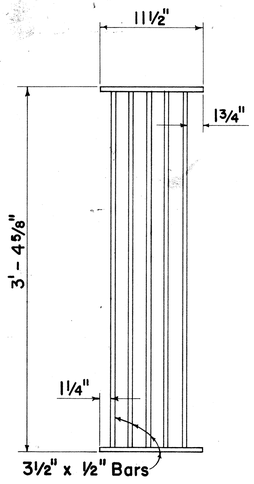
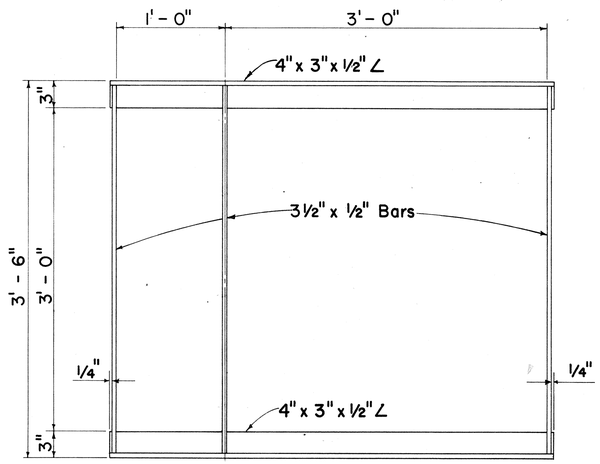
| ORIGINAL PLAN | SURVEY PLOTTED BY | DATE |
|---|---|---|
| NOTE BOOK | DRAWN BY | |
| No. | TRACED BY | |
| | DESIGNED BY | |
| | QUANTITIES BY | |
| | CHECKED BY | |

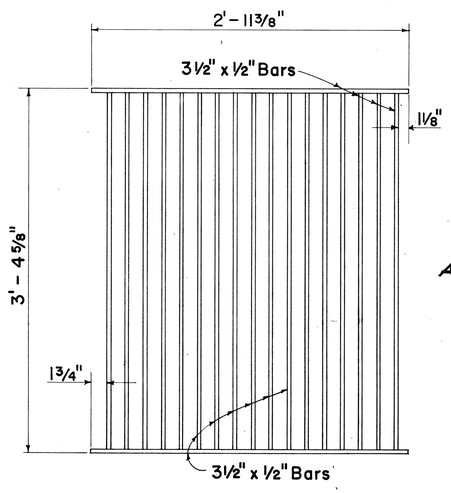
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|---|---|
| HAWAII | HAW. | ~~HH-1(00)15~~ | 1977 | 157 | 350 |



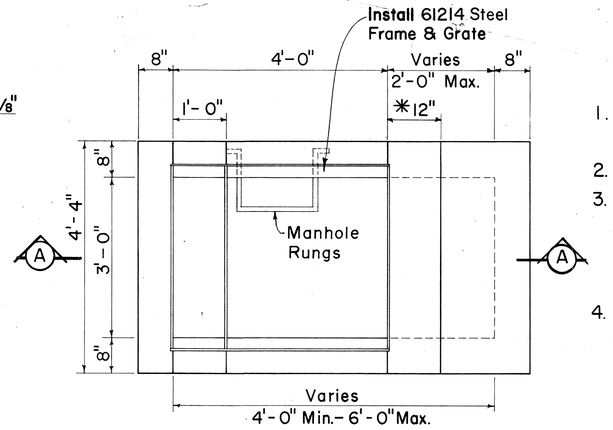

PLAN
Scale: 1½" = 1'-0"



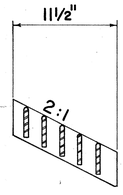

PLAN
Scale: 1½" = 1'-0"



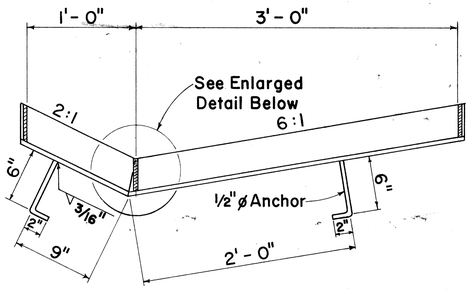

PLAN
Scale: 1½" = 1'-0"



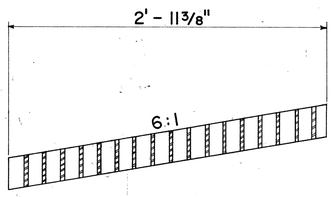

PLAN



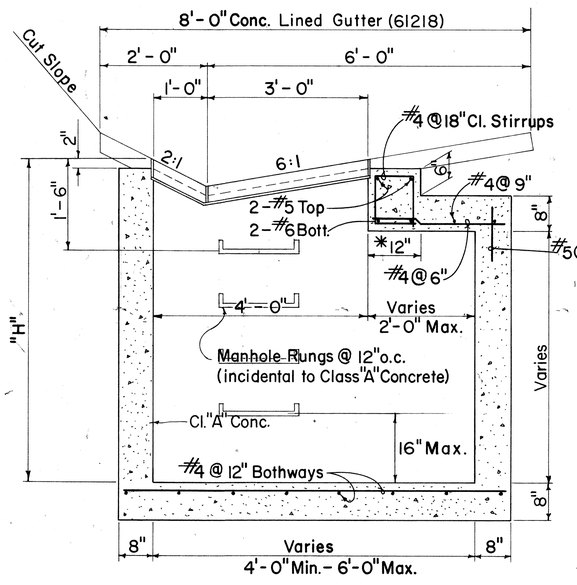

SECTION
Scale: 1½" = 1'-0"




SECTION
Scale: 1½" = 1'-0"



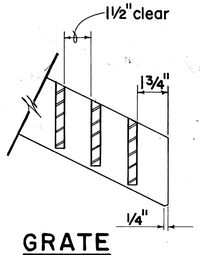

SECTION
Scale: 1½" = 1'-0"



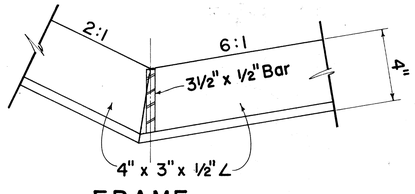

SECTION A - A

DETAIL OF 61214 DROP INTAKE
Scale: ¾" = 1'-0"

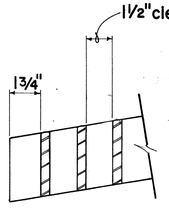
*For Minimum size box of 4'-0" only, use 8" and eliminate reinforcing steel shown in top portion.




GRATE
Scale: 3" = 1'-0"




FRAME
Scale: 3" = 1'-0"




GRATE
Scale: 3" = 1'-0"

| NO. | REVISION | APPROVED BY | DATE |
|---|---|---|---|
| 1. | Spacing on Manhole Rungs to conform to OSHA. | H.T. | 1-21-15 |

## GENERAL NOTES

1. Grates and Frames shall be hot dip galvanized after fabrication, see specifications.
2. All welds ⅜" unless otherwise noted.
3. The Frame & Grate materials shall conform to the specifications of ASTM Designation Structural Steel A283, Grade D and the Standard Specifications.
4. Culvert shall leave Drop Intake from any position and any direction indicated by plans or ordered by the Engineer. Culverts may both enter and leave Drop Intake so that Drop Intake will act as manhole.
5. Manhole Rungs (12"o.c.) are required when "H" is greater than 4 feet 6inches. Only one rung (16 inches from the bottom) is required if "H" is 4 feet 6 inches or less. The Manhole Rungs may be placed at any location as ordered by the Engineer.

APPROVAL RECOMMENDED:
R. Takano — 12-17-69
HYDRAULIC DESIGN ENGINEER — DATE

APPROVED:
[signature] — 12-17-69
ASSISTANT CHIEF, ENGINEERING — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
TYPE 61214
GRATED DROP INTAKE

Scales: As Noted — Date: July 1969

SHEET No. 21 OF 21 SHEETS DH-9

| ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE |
|---|---|---|---|---|---|---|---|
| NOTE BOOK | | | | | | | |
| No. | | | | | | | |

# DETAILS OF TYPE 61214 STEEL FRAME AND GRATES