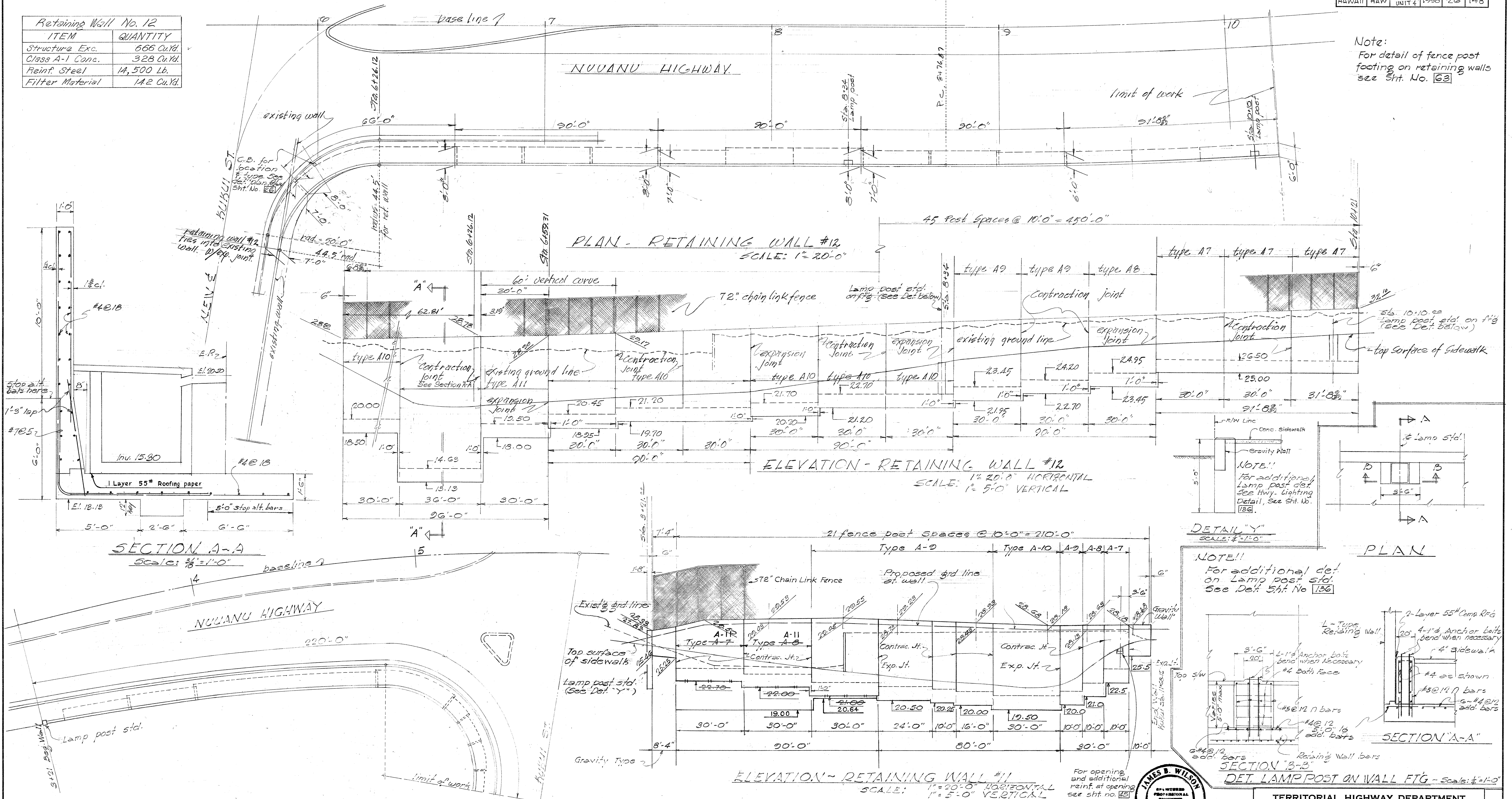


| Retaining Wall No. 12 |            |
|-----------------------|------------|
| ITEM                  | QUANTITY   |
| Structure Exc.        | 666 Cu.Yd. |
| Class A-1 Conc.       | 328 Cu.Yd. |
| Reinf. Steel          | 14,500 Lb. |
| Filter Material       | 142 Cu.Yd. |

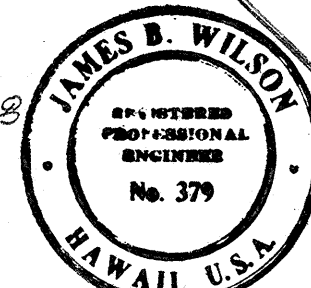
Note:  
For detail of fence post footing on retaining walls see Sht. No. 63



|                       |      |
|-----------------------|------|
| SURVEY PLOTTED BY     | DATE |
| DRAWN BY              |      |
| CHECKED BY            |      |
| QUANTITIES CHECKED BY |      |
| NOTE BOOK NO.         |      |

| Retaining Wall No. 11 |            |
|-----------------------|------------|
| ITEM                  | QUANTITY   |
| Structure Exc.        | 261 Cu.Yd. |
| Class A-1 Concrete    | 131 Cu.Yd. |
| Reinf. Steel          | 5,549 Lbs. |
| Filter Material       | 32 Cu.Yd.  |

NOTE:  
FOR DRAINAGE, REINFORCEMENT & OTHER DETAILS SEE RETAINING WALL DETAILS, SHT. NO. 63  
FOR REINFORCEMENTS ON STEPPED FOOTING DETAILS-SEE STANDARD DETAILS FOR RETAINING WALL, SHT. NO. 64



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James B. Wilson  
REGISTERED ENGINEER  
DATE JUL 3 1957

TERRITORIAL HIGHWAY DEPARTMENT  
TERRITORY OF HAWAII  
NUUANU HIGHWAY  
PROJECT NO. BU-061-106, UNIT 4  
L-TYPE RETAINING WALL  
STRUCTURAL DETAILS  
SEPT. 1957



| RET. WALL #13   |              |
|-----------------|--------------|
| Item            | Quantities   |
| Class A-1 Conc. | 640 C.Y.     |
| Reinf. Steel    | 65,941 Lbs.  |
| Struct. Exo.    | 657 C.Y.     |
| Filter Mat.     | 350 C.Y.     |
| Alu. Paving     | 316 Lin. Ft. |

| RET. WALL #13   |              |
|-----------------|--------------|
| Item            | Quantities   |
| Class A-1 Conc. | 640 C.Y.     |
| Reinf. Steel    | 65,941 Lbs.  |
| Struct. Exo.    | 657 C.Y.     |
| Filter Mat.     | 350 C.Y.     |
| Alu. Paving     | 316 Lin. Ft. |

SCALE: 1" = 20'-0" Horizontal  
1" = 5'-0" Vertical.



NUUANU HIGHWAY

## STRUCTURAL DETAILS.

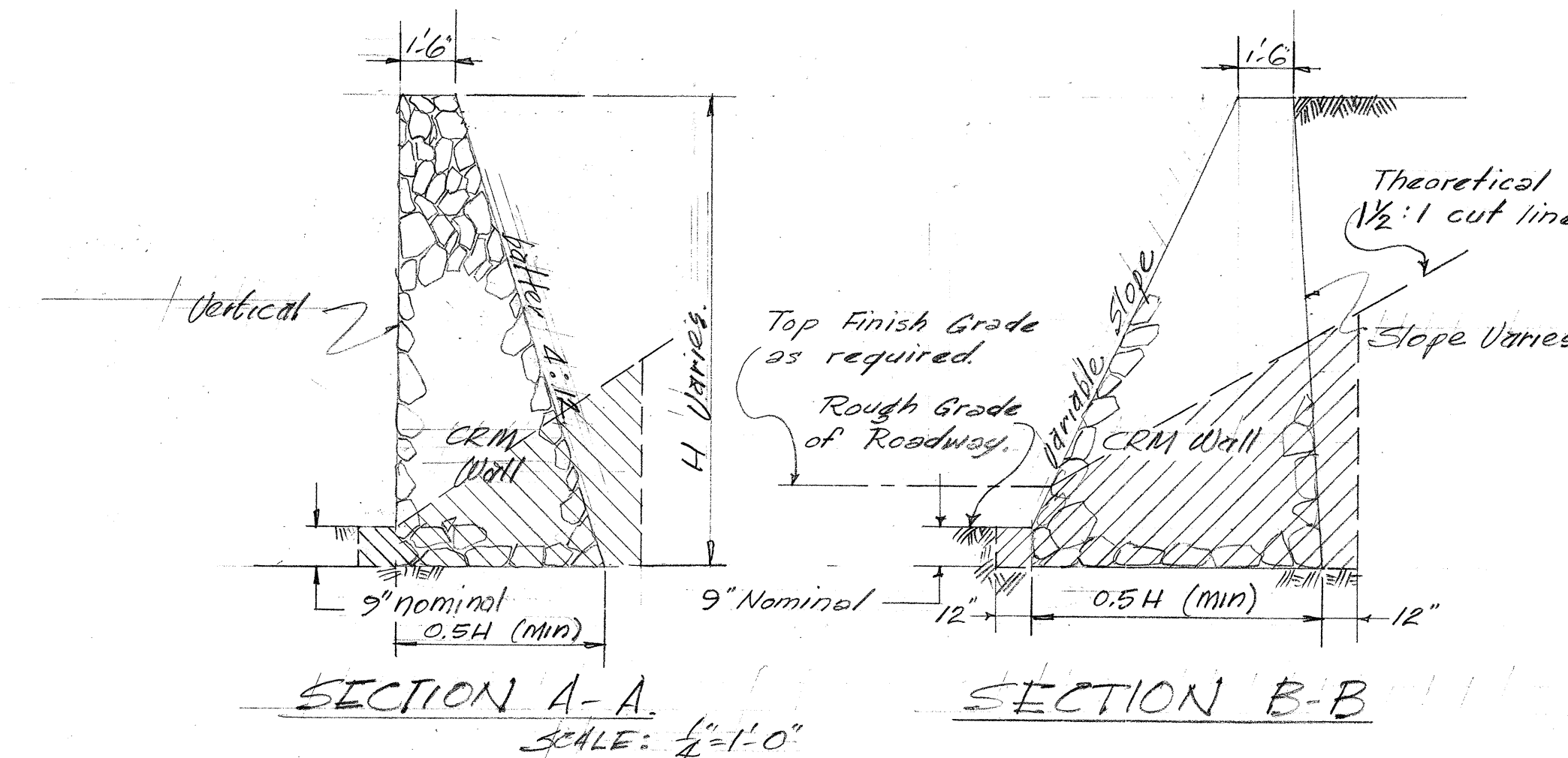
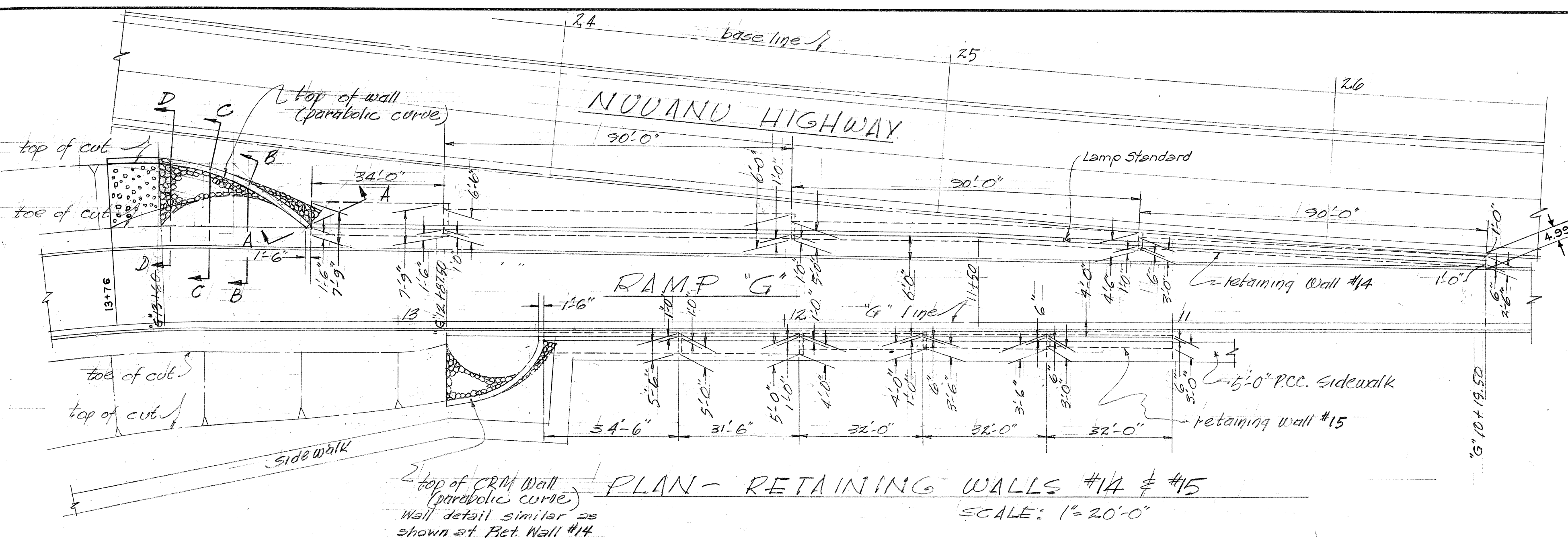
SHEET No. 2 OF 6 SHEETS

**. § 146 (2).27** 60

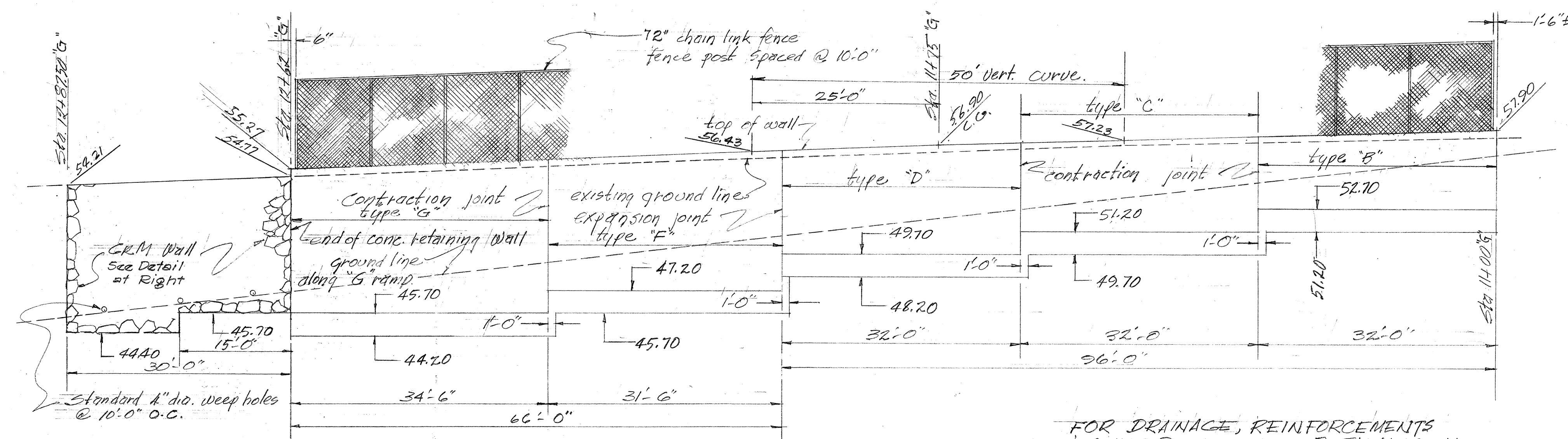
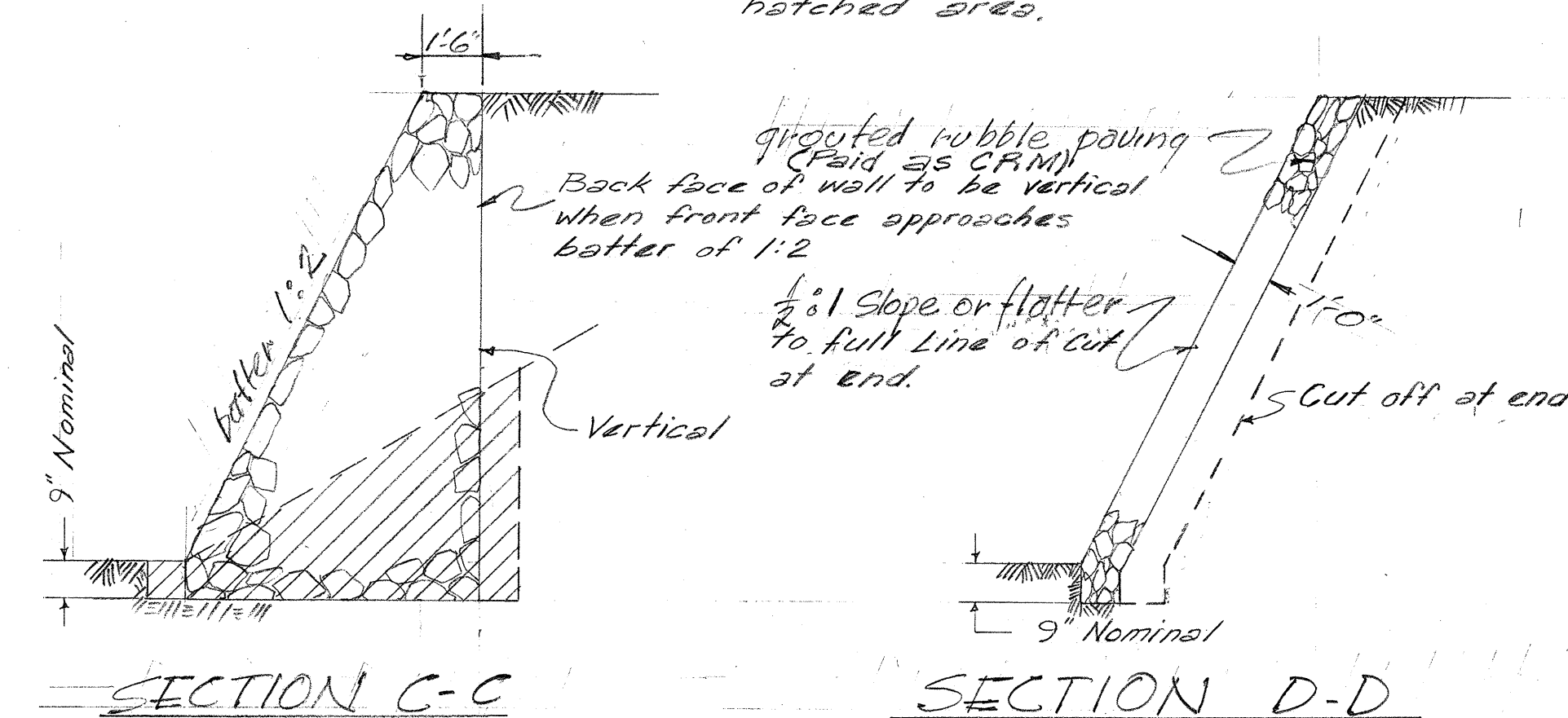


(REV.)  
2-11-59

| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW   | BU-061-1(6)        | 1958        | 25        | 148          |



Note: Pay limits for structural excavation indicated by hatched area.



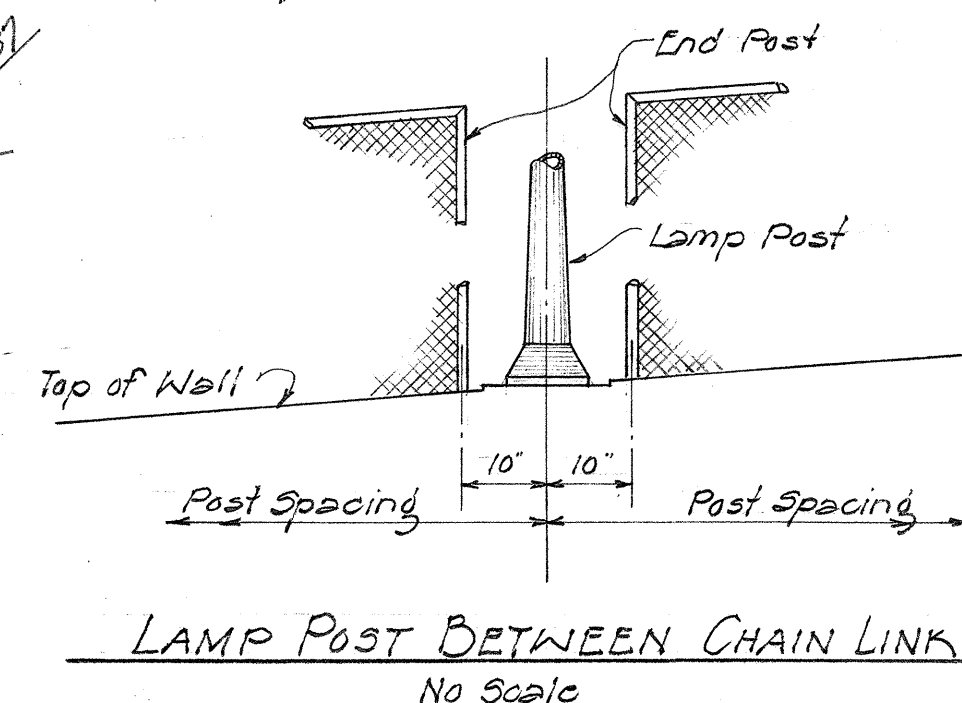
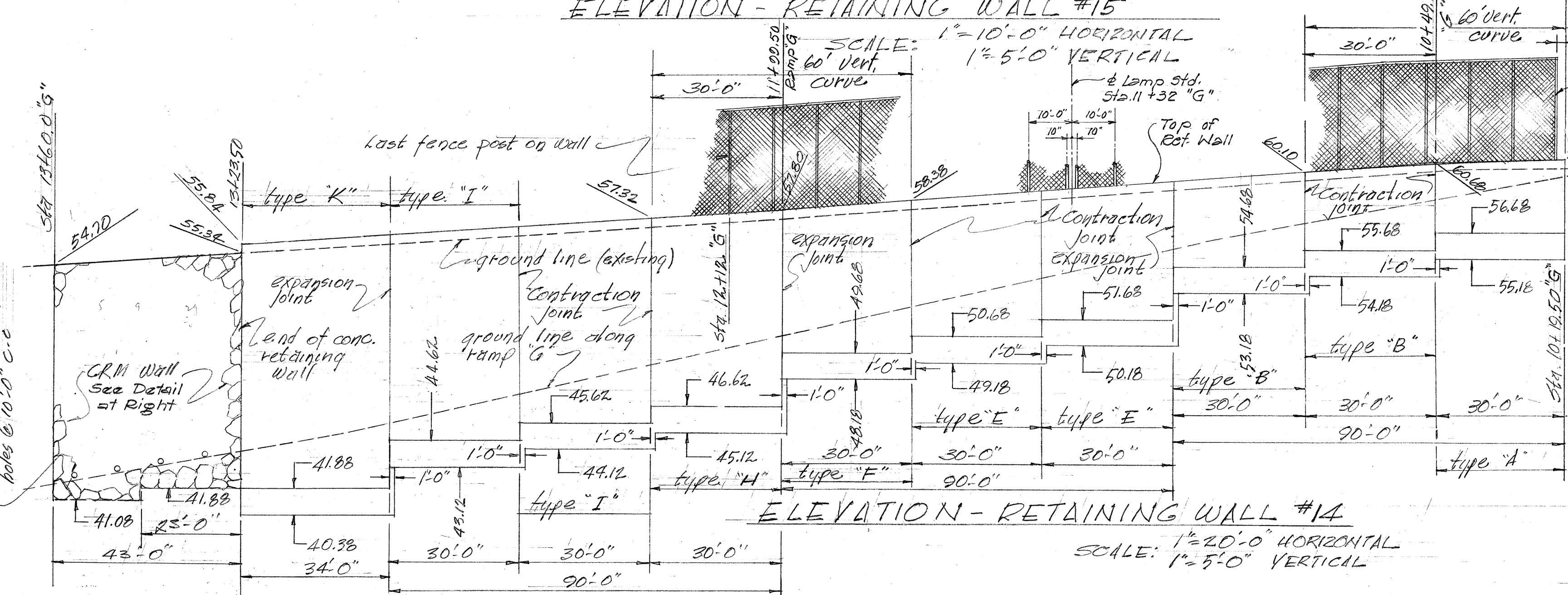
FOR DRAINAGE, REINFORCEMENTS & OTHER DETAILS-SEE RETAINING WALL STANDARDS, SHT. NO. 62

| Item            | Quantities  |
|-----------------|-------------|
| Class A-1 Conc. | 102 C.Y.    |
| Reinf. Steel    | 12,113 Lbs. |
| Struct. Exc.    | 456.5 C.Y.  |
| Filter Mat.     | 121 C.Y.    |
| CRM Wall        | 60 C.Y.     |
| Roadway Exc.    | 206 C.Y.    |

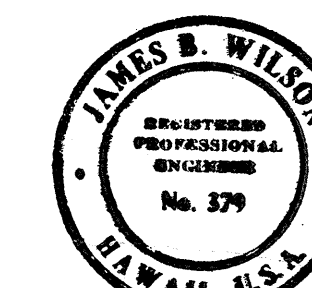
| Item            | Quantities |
|-----------------|------------|
| Class A-1 Conc. | 84 C.Y.    |
| Reinf. Steel    | 4,273 Lbs. |
| Struct. Exc.    | 195.1 C.Y. |
| Filter Mat.     | 47 C.Y.    |
| CRM Wall        | 26 C.Y.    |
| Roadway Exc.    | 66 C.Y.    |

ELEVATION - RETAINING WALL #15

SCALE: 1"=10'-0" HORIZONTAL  
1"=5'-0" VERTICAL



Note:  
For detail of Fence Post Footing on Retaining Walls, See Sht. No. 63  
For drainage, reinforcements and other details - see Retaining Wall Standards, Sheet No. 64



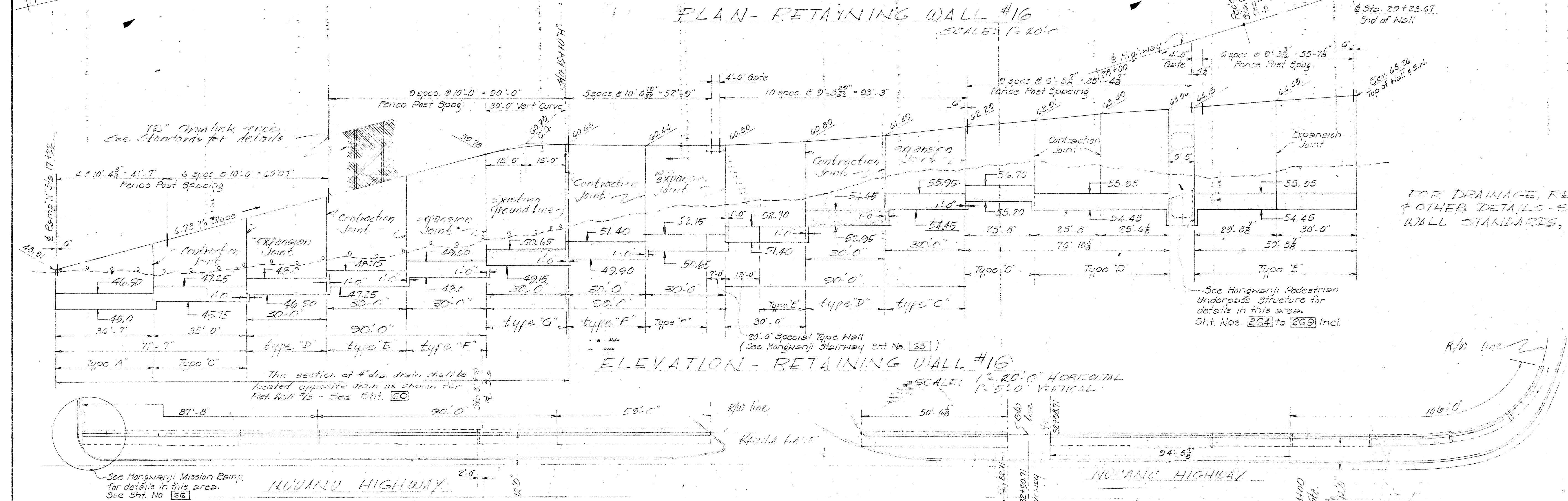
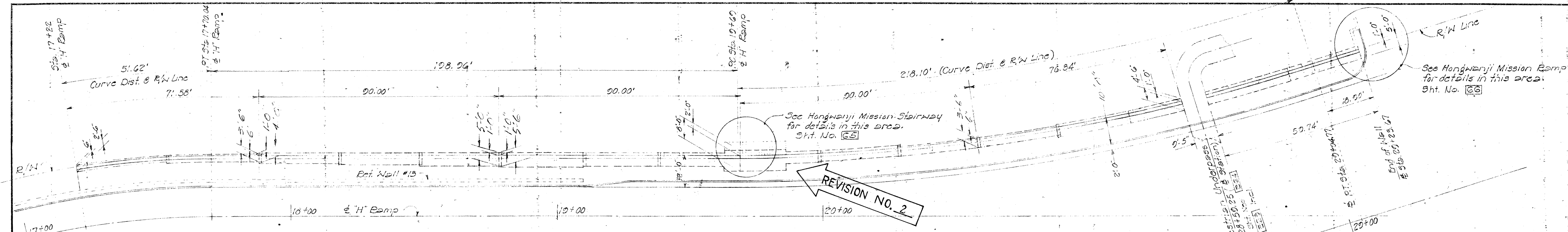
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James B. Wilson  
REGISTERED ENGINEER  
DATE JUL 3 1957

TERRITORIAL HIGHWAY DEPARTMENT  
TERRITORY OF HAWAII  
NUUANU HIGHWAY  
PROJECT NO. BU-061-1(6), UNIT 4  
RETAINING WALL  
STRUCTURAL DETAILS  
SEPT. 1957

SHEET NO. 3 OF 6 SHEETS

.8146 (2).28



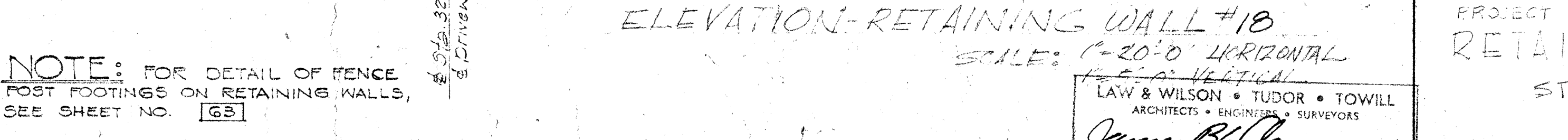
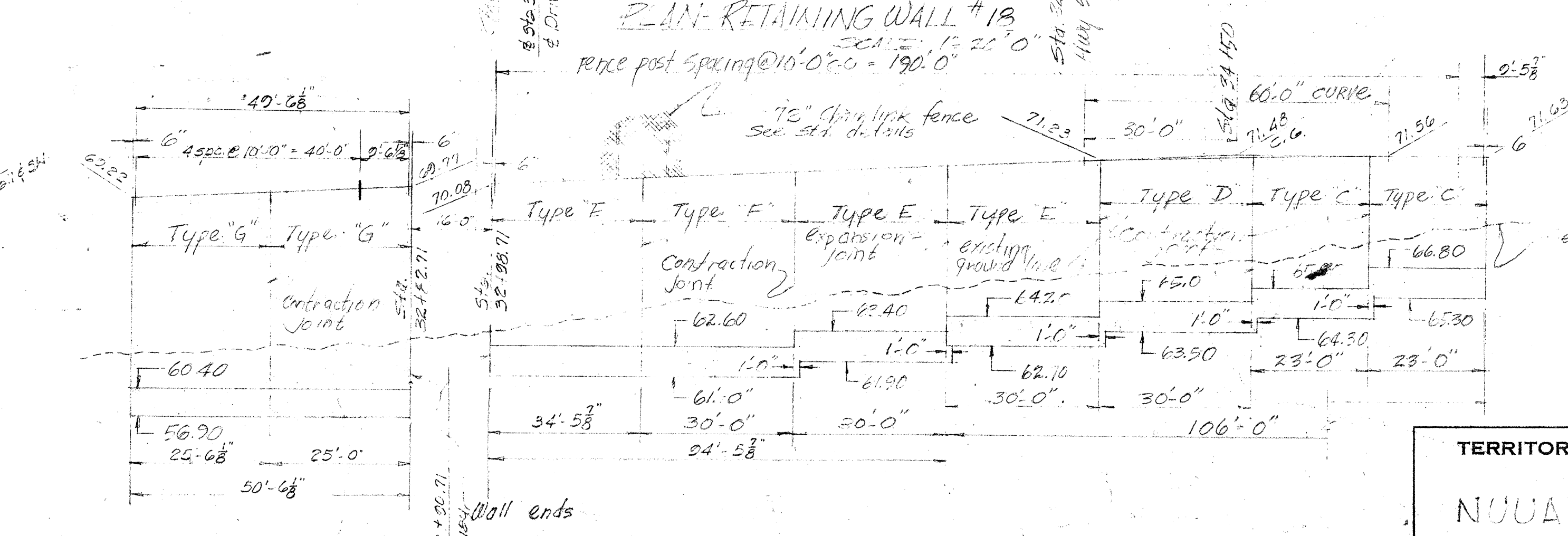
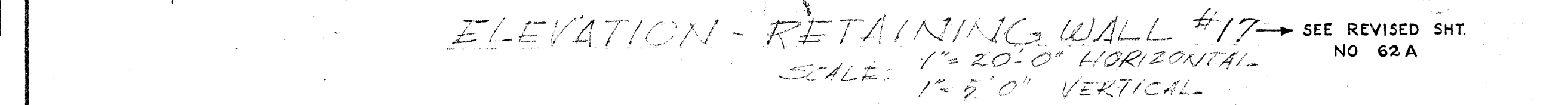
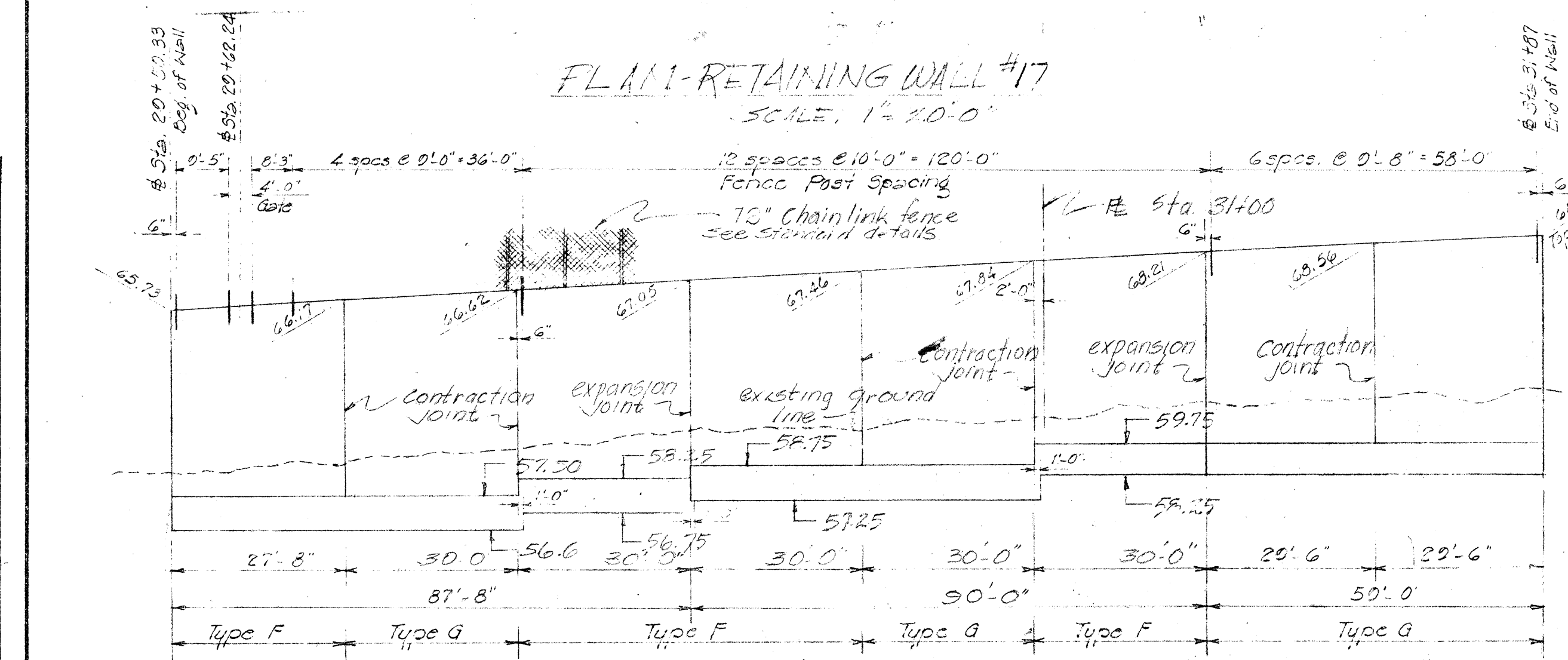


### EST. QUANTITIES

| RET. WALL #16   |            |
|-----------------|------------|
| Item            | Quantities |
| Class A-1 Conc. | 232 C.Y.   |
| Reinf. Steel    | 1,150 lbs. |
| Struct. Exc.    | 237 C.Y.   |
| Filter Mat      | 131 C.Y.   |

| RET. WALL #17   |            |
|-----------------|------------|
| Item            | Quantities |
| Class A-1 Conc. | 150 C.Y.   |
| Reinf. Steel    | 9,004 lbs. |
| Struct. Exc.    | 205 C.Y.   |
| Filter Mat      | 103 C.Y.   |

| RET. WALL #18   |            |
|-----------------|------------|
| Item            | Quantities |
| Class A-1 Conc. | 140 C.Y.   |
| Reinf. Steel    | 7,420 lbs. |
| Struct. Exc.    | 108 C.Y.   |
| Filter Mat      | 85 C.Y.    |



NOTE: FOR DETAIL OF FENCE POST FOOTINGS ON RETAINING WALLS, SEE SHEET NO. 63

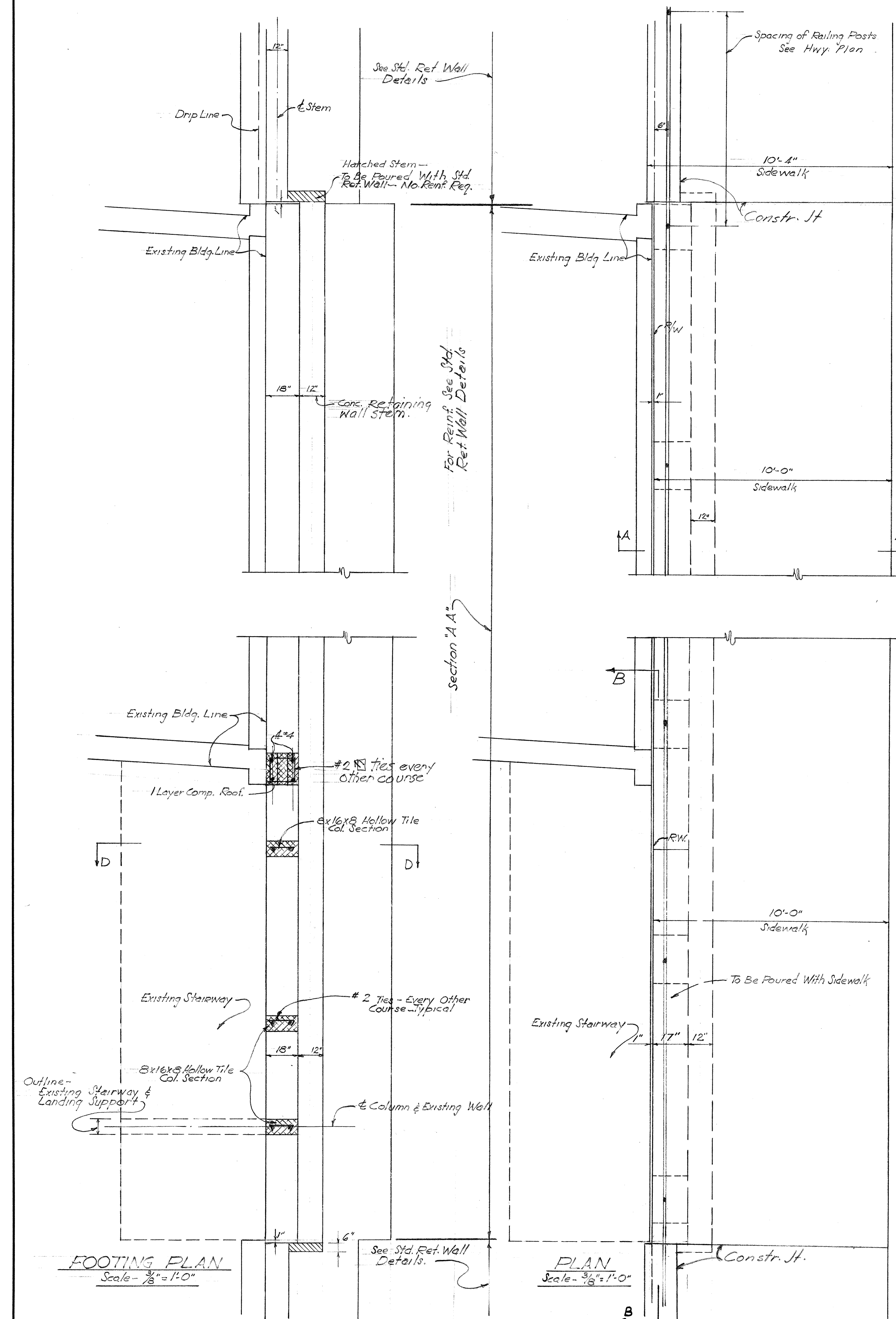
**TERRITORIAL HIGHWAY DEPARTMENT**  
TERRITORY OF HAWAII  
**NUUANU HIGHWAY**  
PROJECT NO. BU-061-1161, UNIT 4  
**RETAINING WALL**  
STRUCTURAL DETAILS  
SEPT. 1957

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James B. Wilson  
REGISTERED ENGINEER  
DATE JUL 3 1957

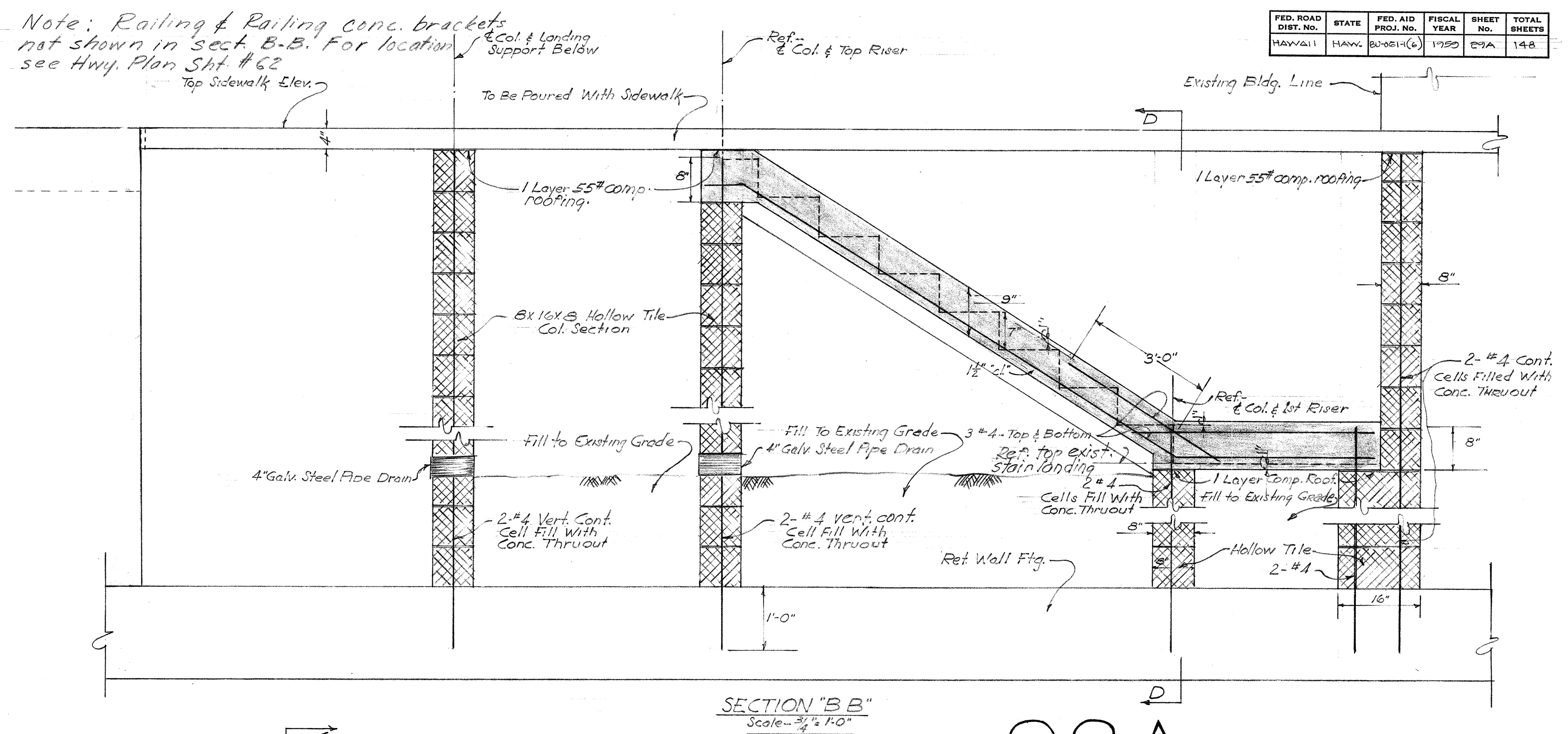
DESIGNED BY  
DRAWN BY  
CHECKED BY  
QUANTITIES CHECKED BY  
NOTE BOOK  
No.



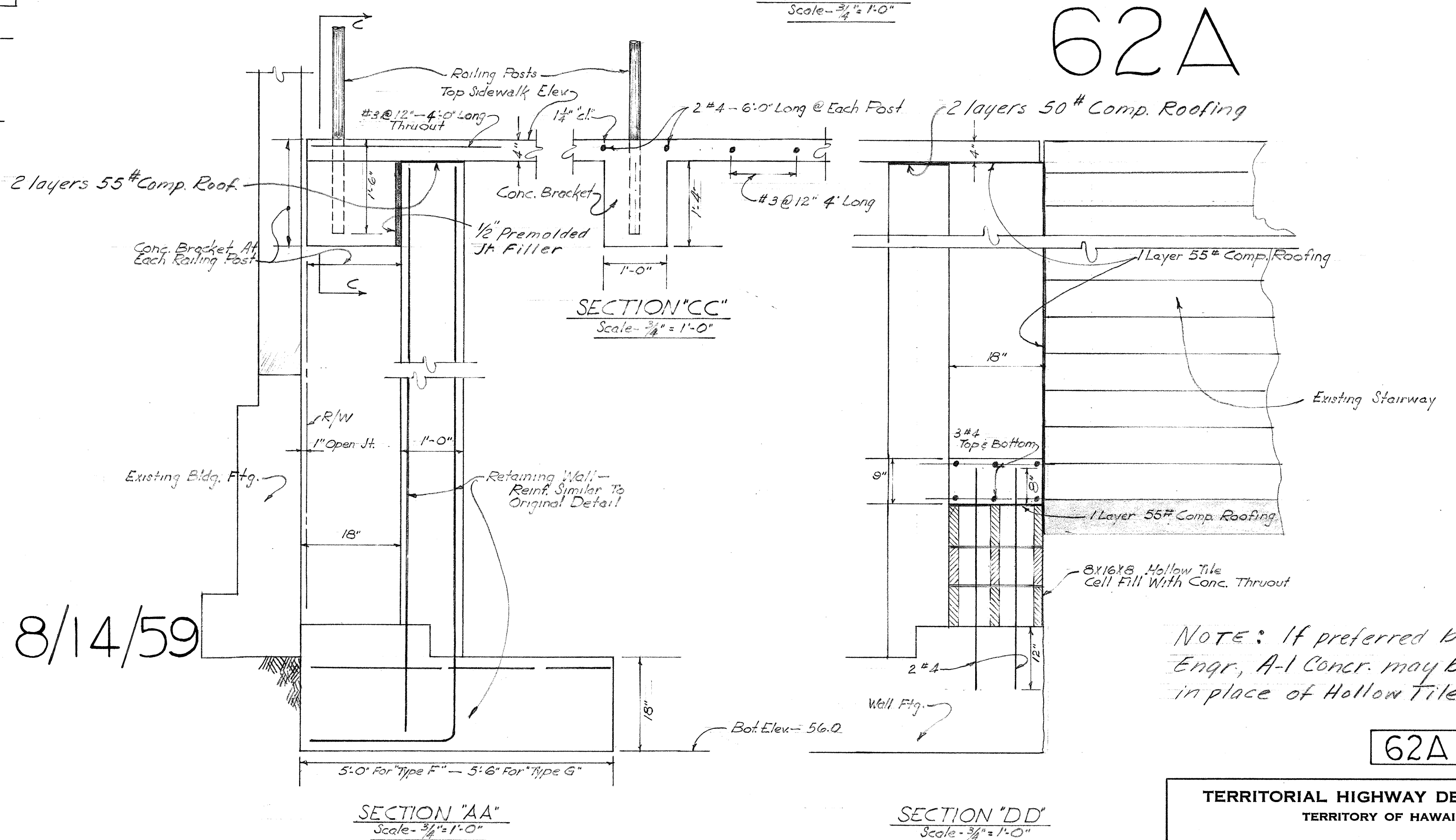
| FED. ROAD<br>DIST. No. | STATE | FED. AID<br>PROJ. No. | FISCAL<br>YEAR | SHEET<br>No. | TOTAL<br>SHEETS |
|------------------------|-------|-----------------------|----------------|--------------|-----------------|
| HAWAII                 | HAW.  | BW-061-(6)            | 1959           | 29A          | 148             |



Note: Railing & Railing conc. brackets  
not shown in sect. B-B. For location  
see Hwy. Plan Sht. #62



62 A



NOTE: If preferred by field Engr, A-1 Concr. may be used in place of Hollow Tile

62A

**TERRITORIAL HIGHWAY DEPARTMENT**  
**TERRITORY OF HAWAII**

NUUANU HIGHWAY  
PROJECT NO. BU-061-1(6)  
UNIT 4-STA. 29.90  
REVISION OF RETAINING WALL #17  
HONGWANJI MISSION

AUG. 1959

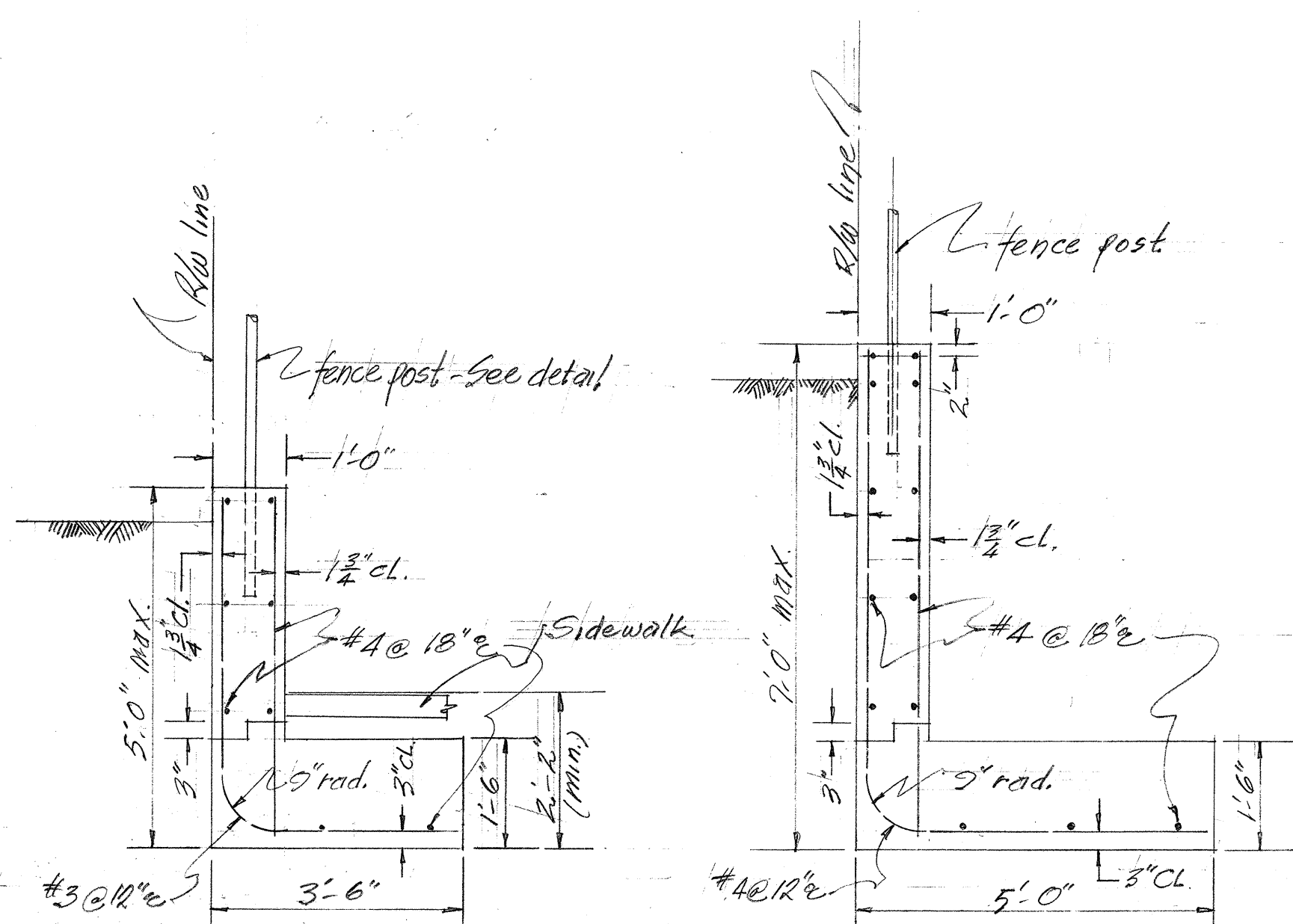
SHEET No.      OF      SHEETS

**. 8146 (2).29A** 62A

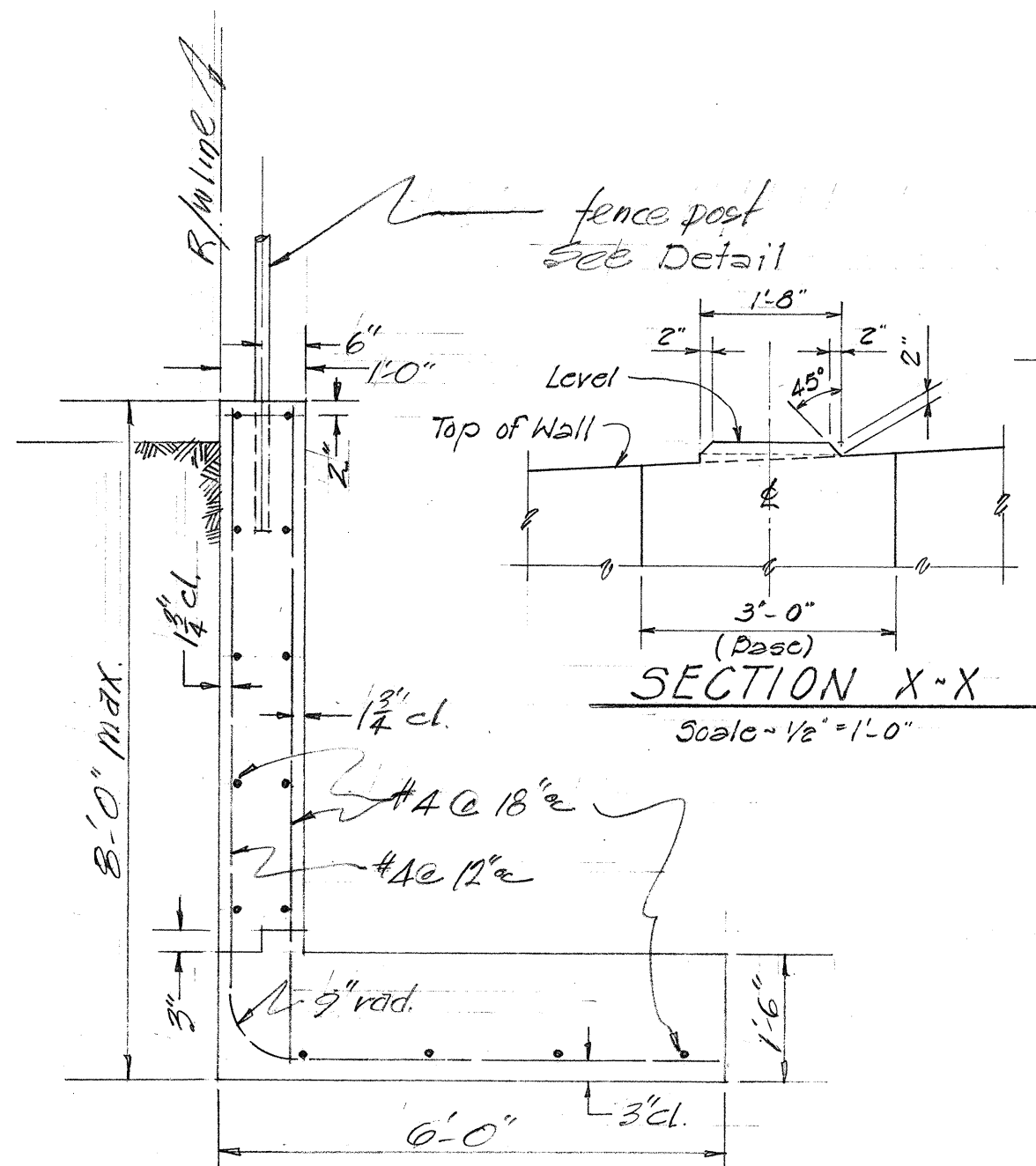


(REV.)  
2-11-59

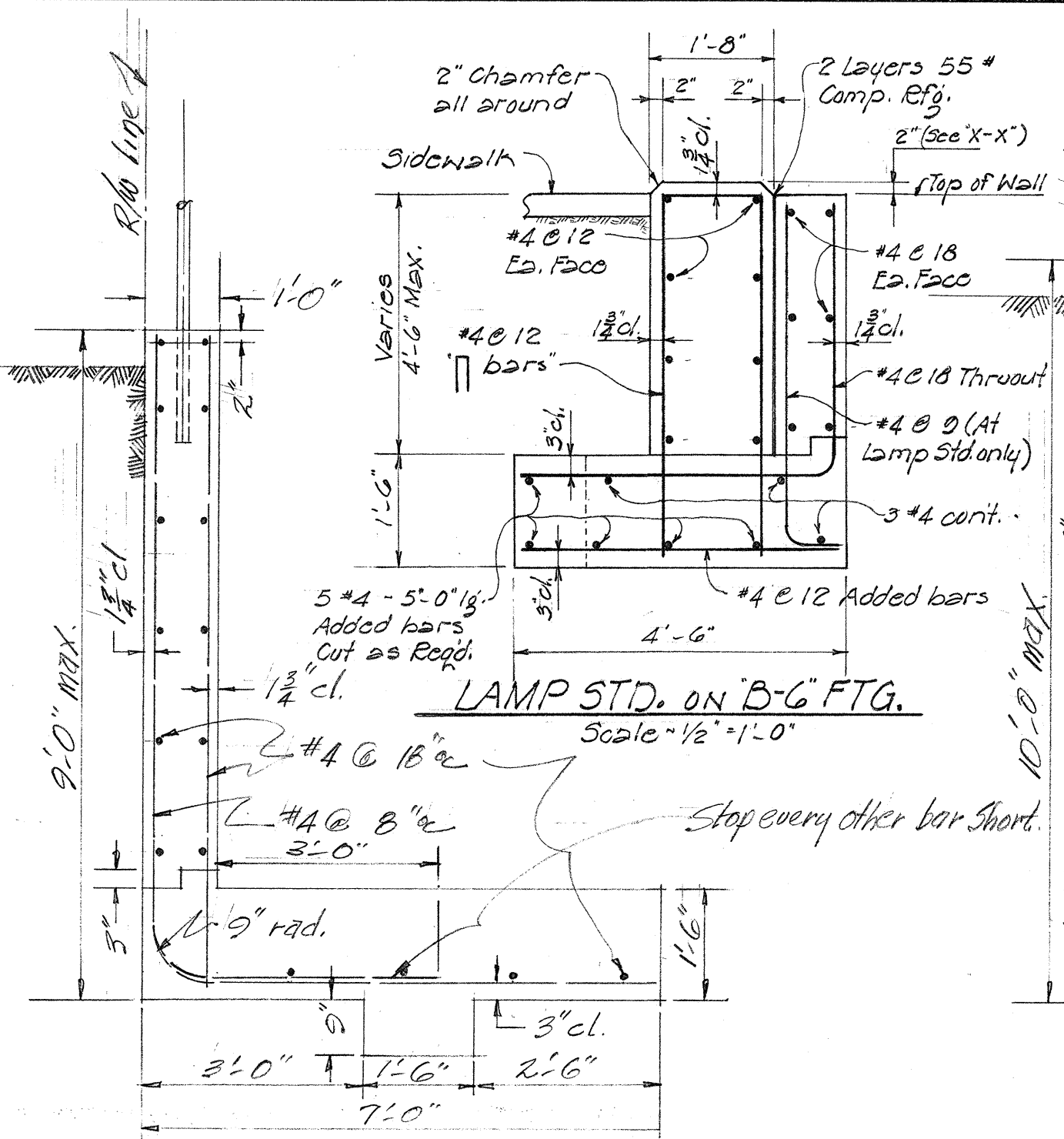
| FED. ROAD DIST. NO. | STATE | FED. AID PROJ. NO. | FISCAL YEAR | SHEET NO. | TOTAL SHEETS |
|---------------------|-------|--------------------|-------------|-----------|--------------|
| HAWAII              | HAW   | BU-OG-16 UNIT 4    | 1958        | 30        | 148          |



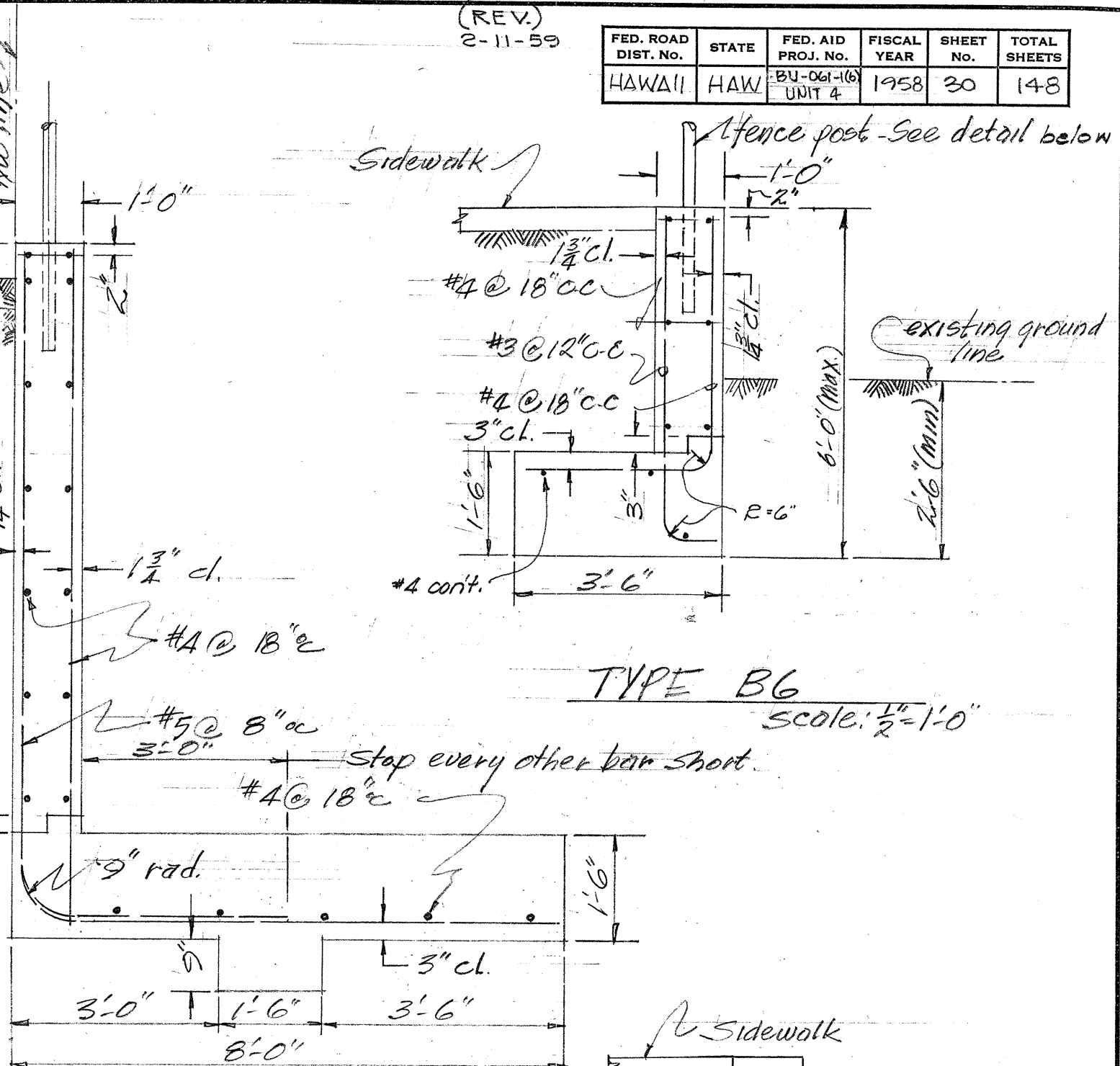
TYPE A5



TYPE A7



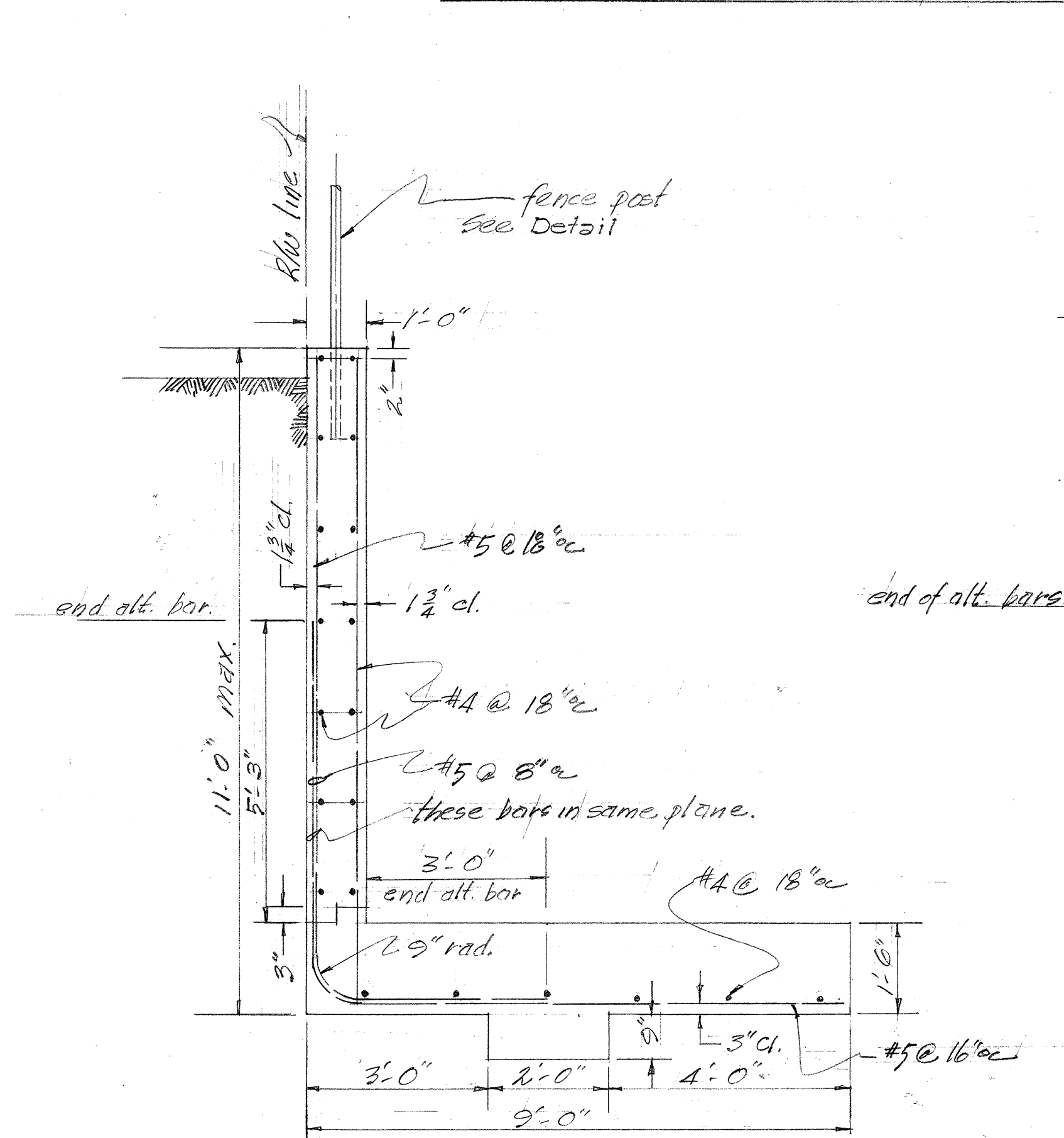
TYPE A9



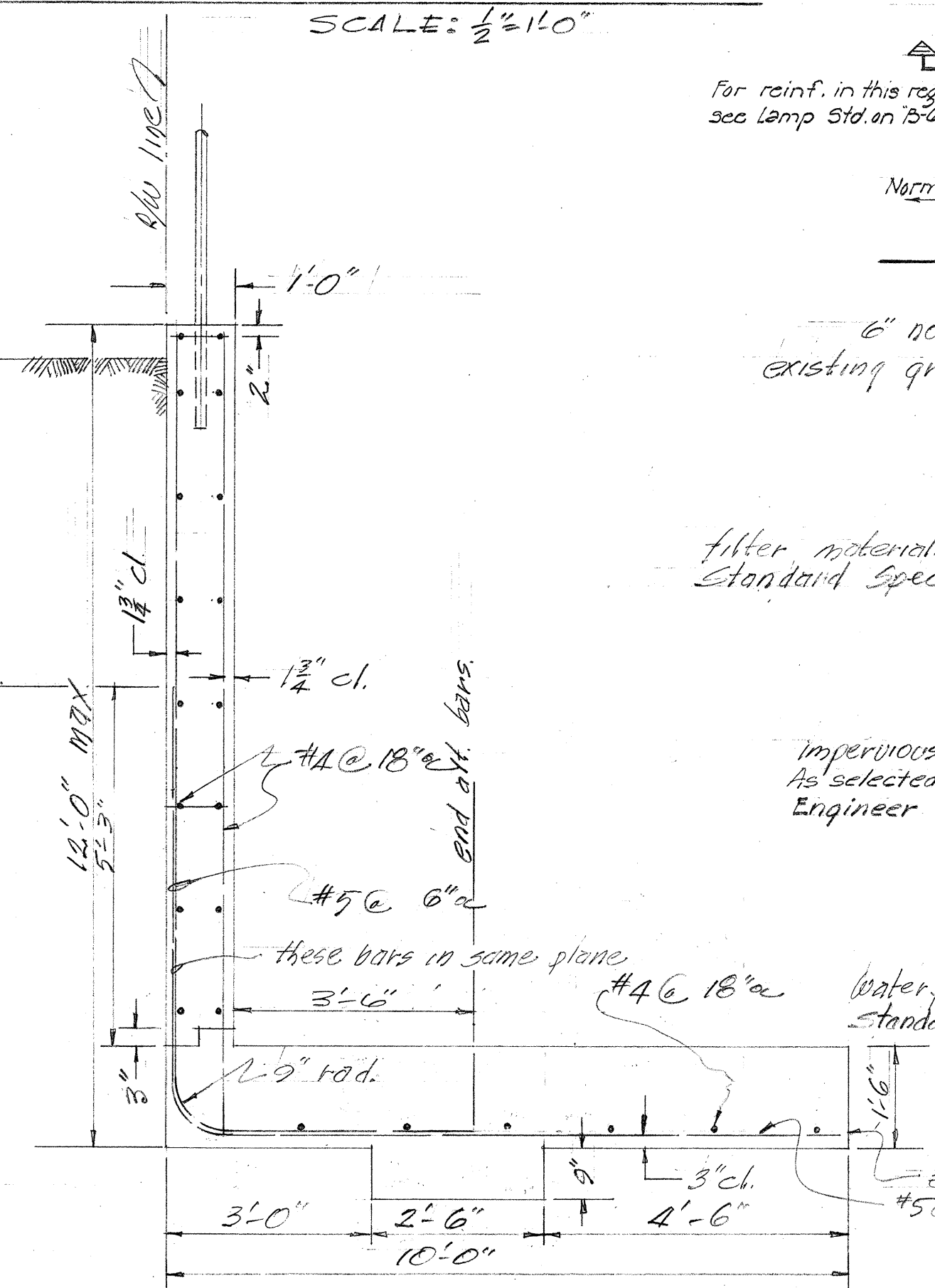
TYPE A10

# L - TYPE RETAINING WALL DETAILS

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



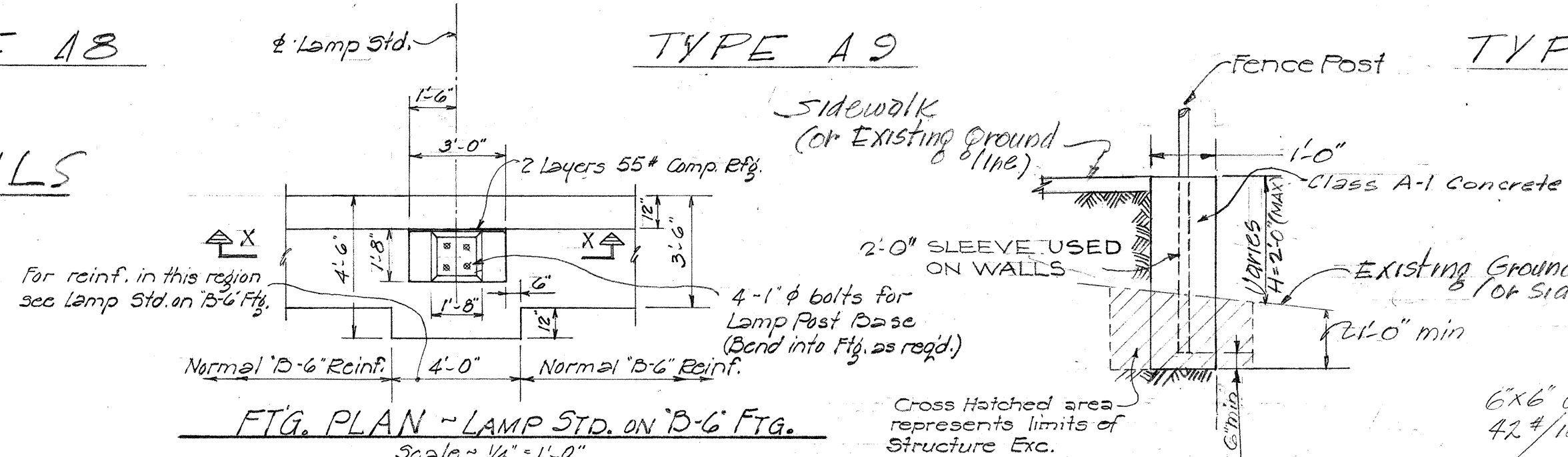
TYPE A11



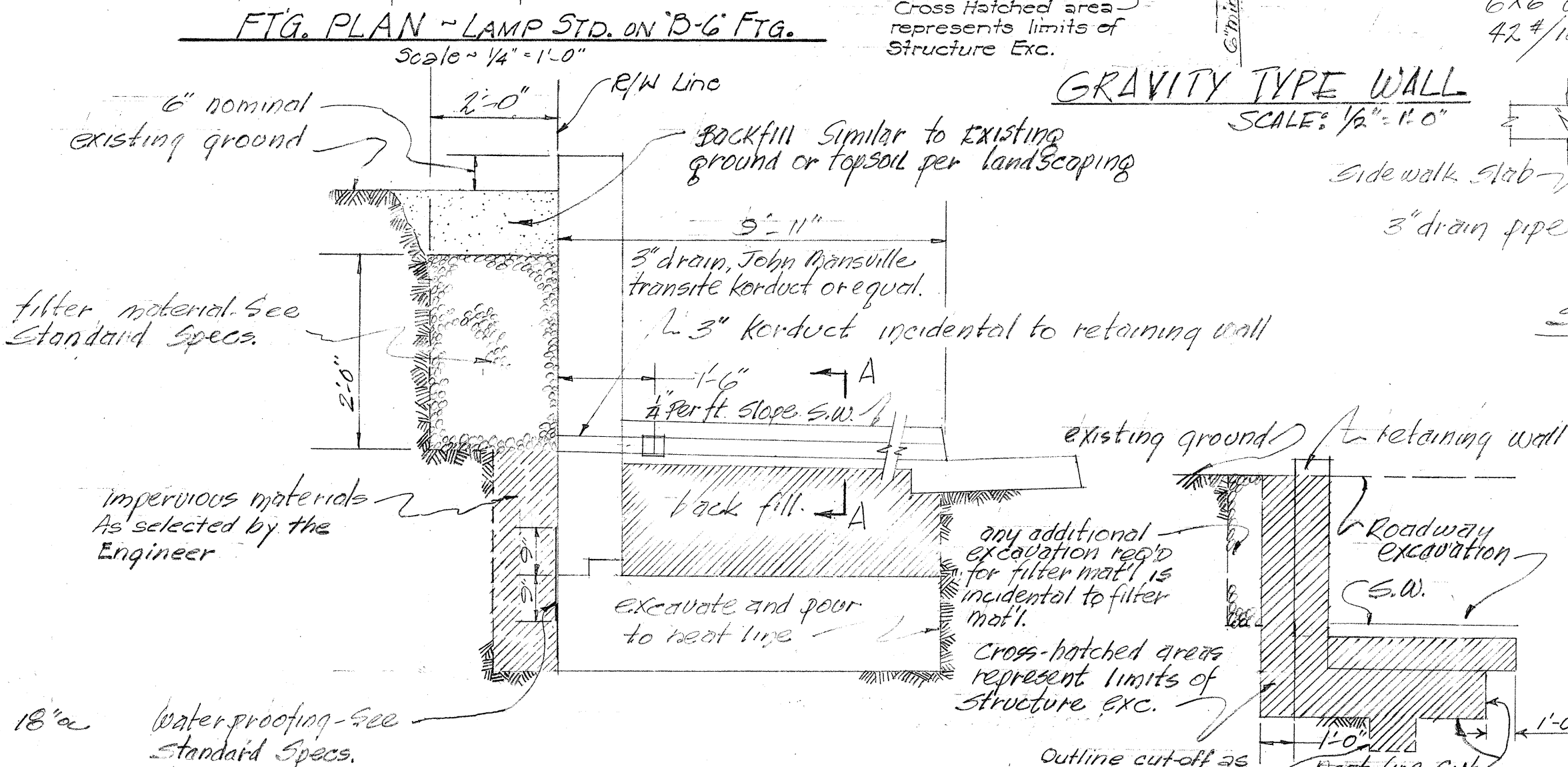
TYPE A12

# L - TYPE RETAINING WALL

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



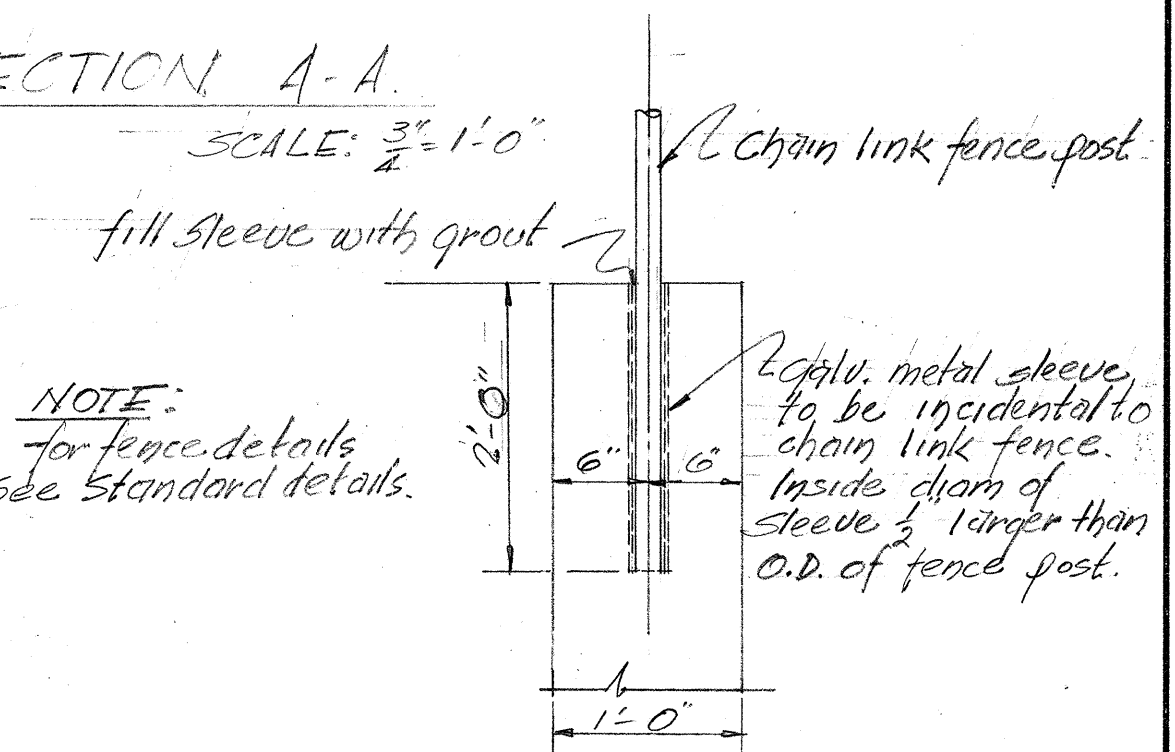
TYPE A10



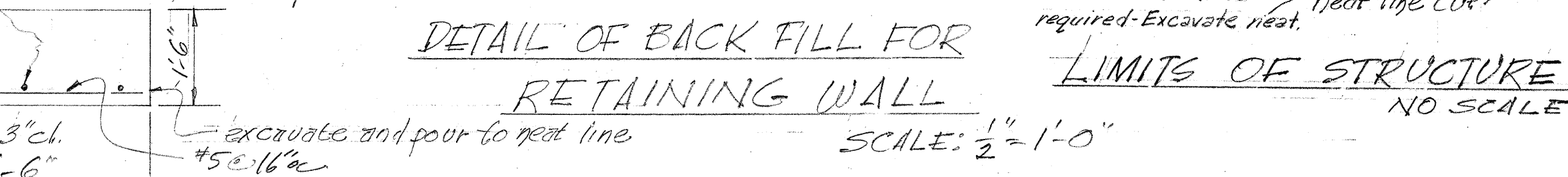
GRAVITY TYPE WALL

# LIMITS OF STRUCTURE EXC. FOR TYPE B

NO SCALE.

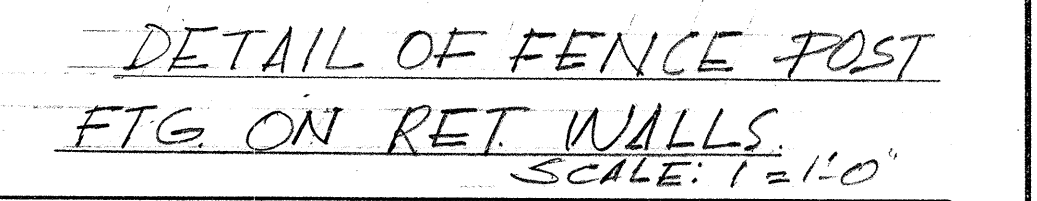


SECTION A-A



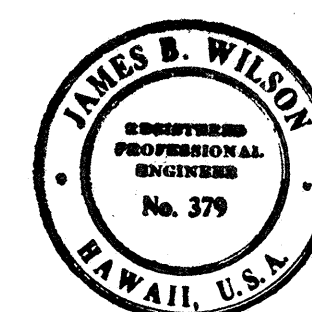
DETAIL OF BACK FILL FOR RETAINING WALL

# LIMITS OF STRUCTURE EXC. NO SCALE



DETAIL OF FENCE POST FTG ON RET. WALLS

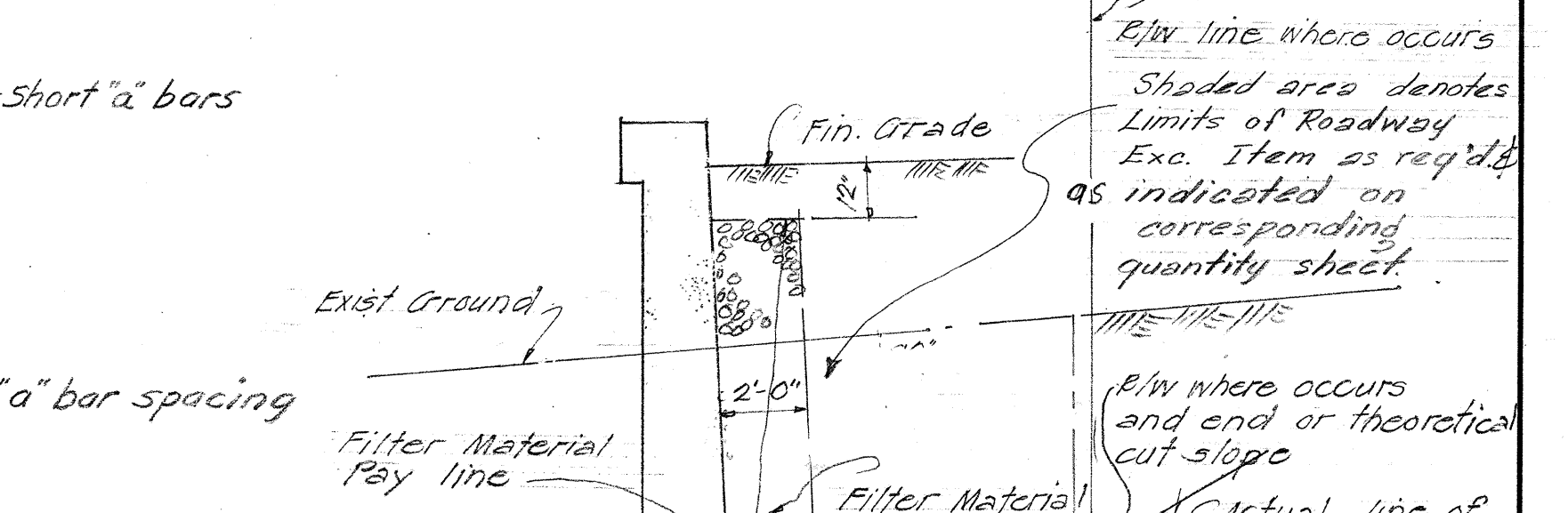
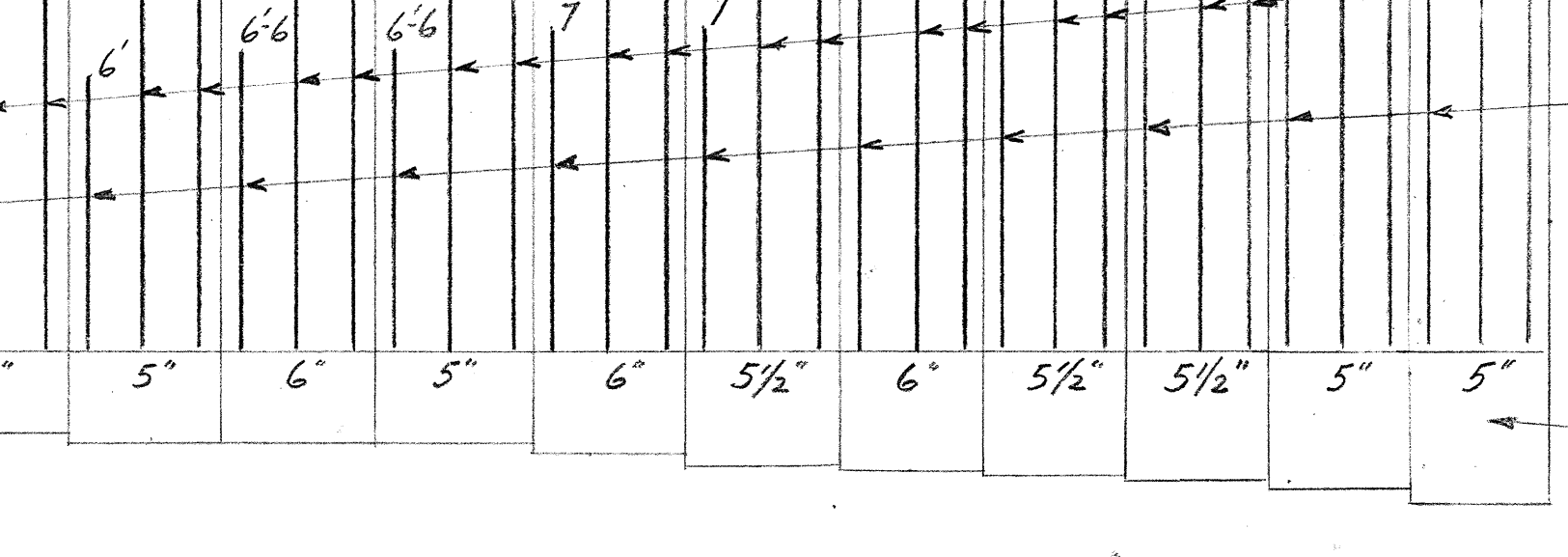
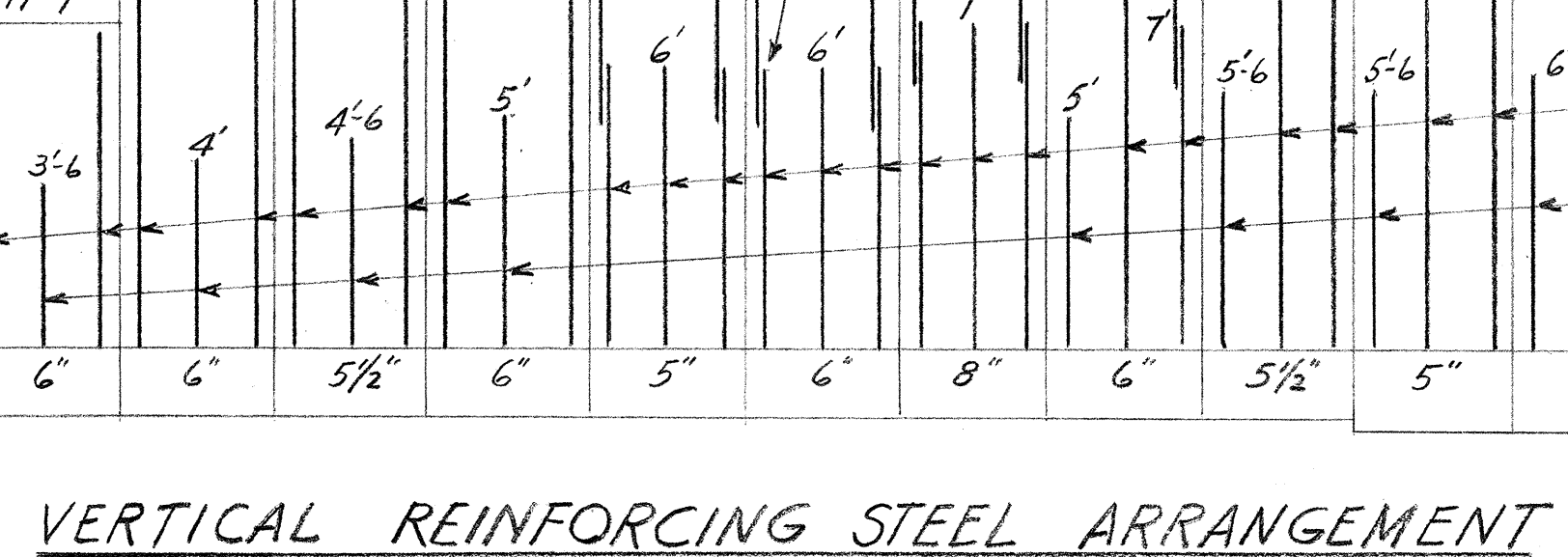
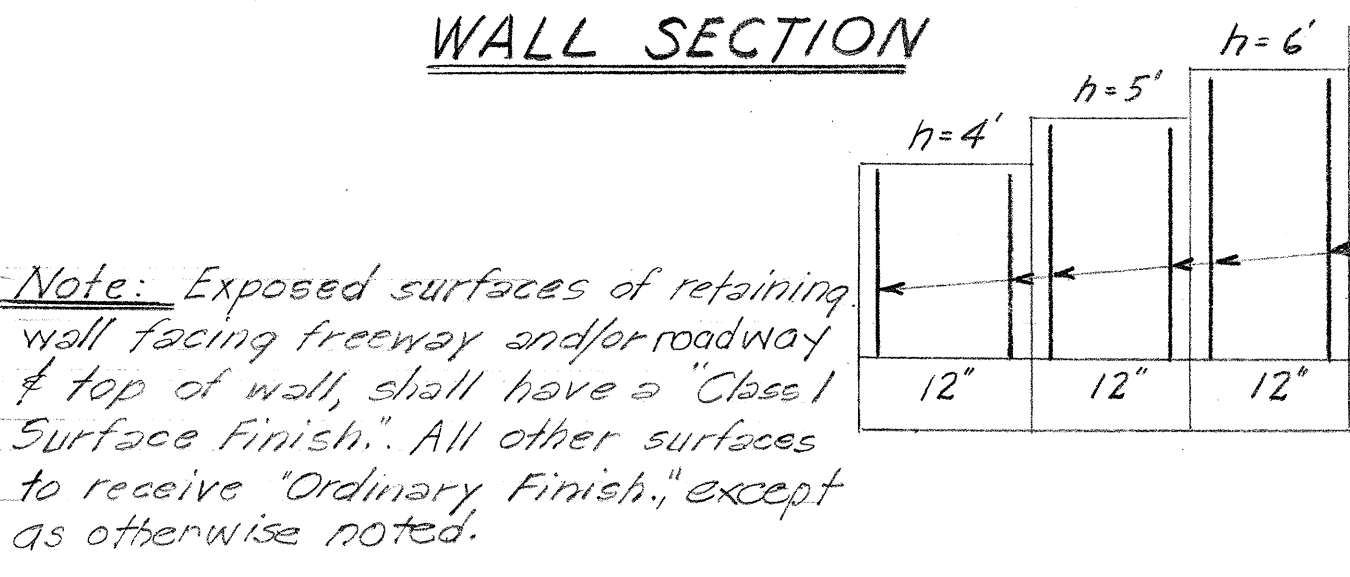
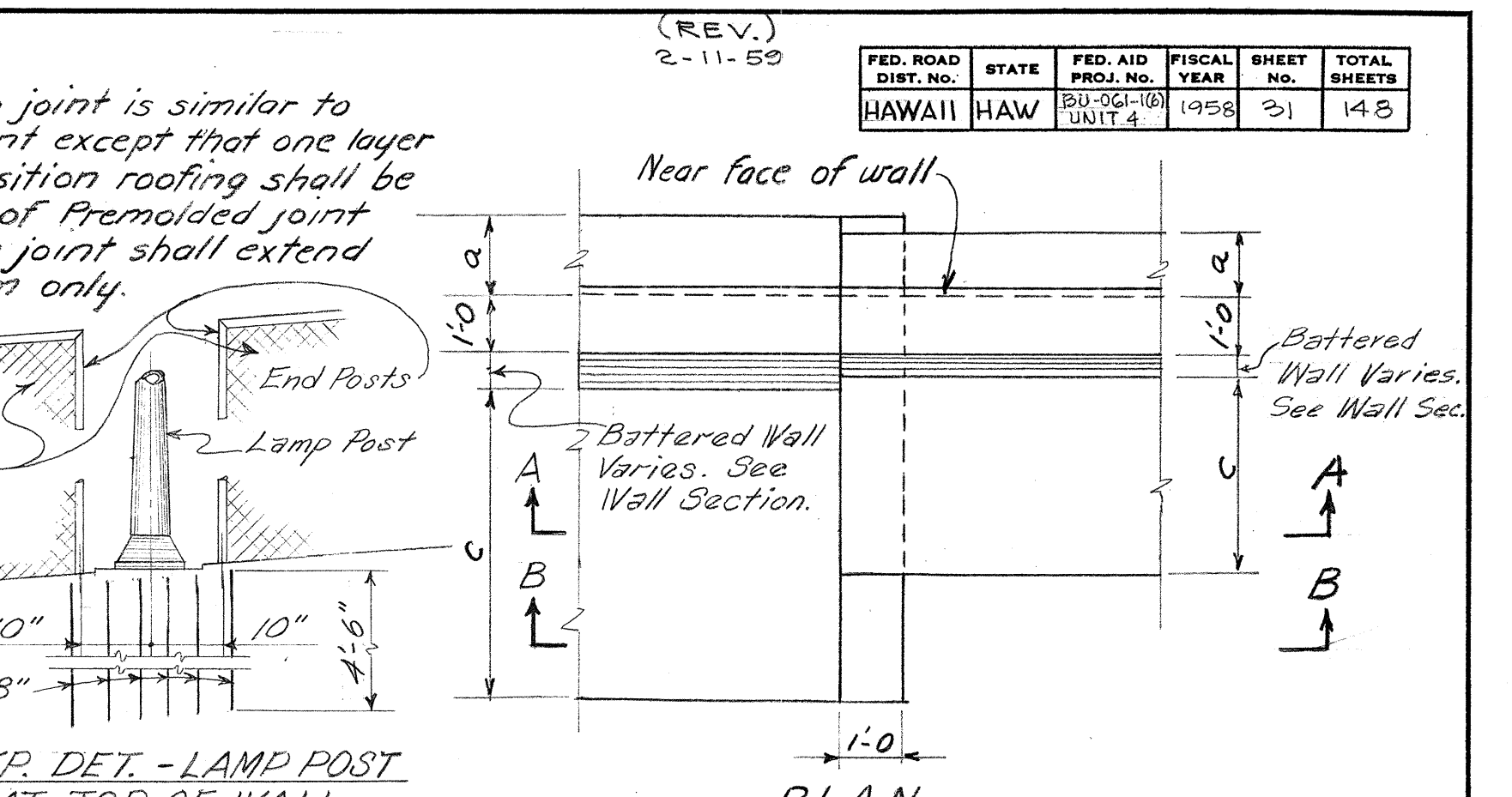
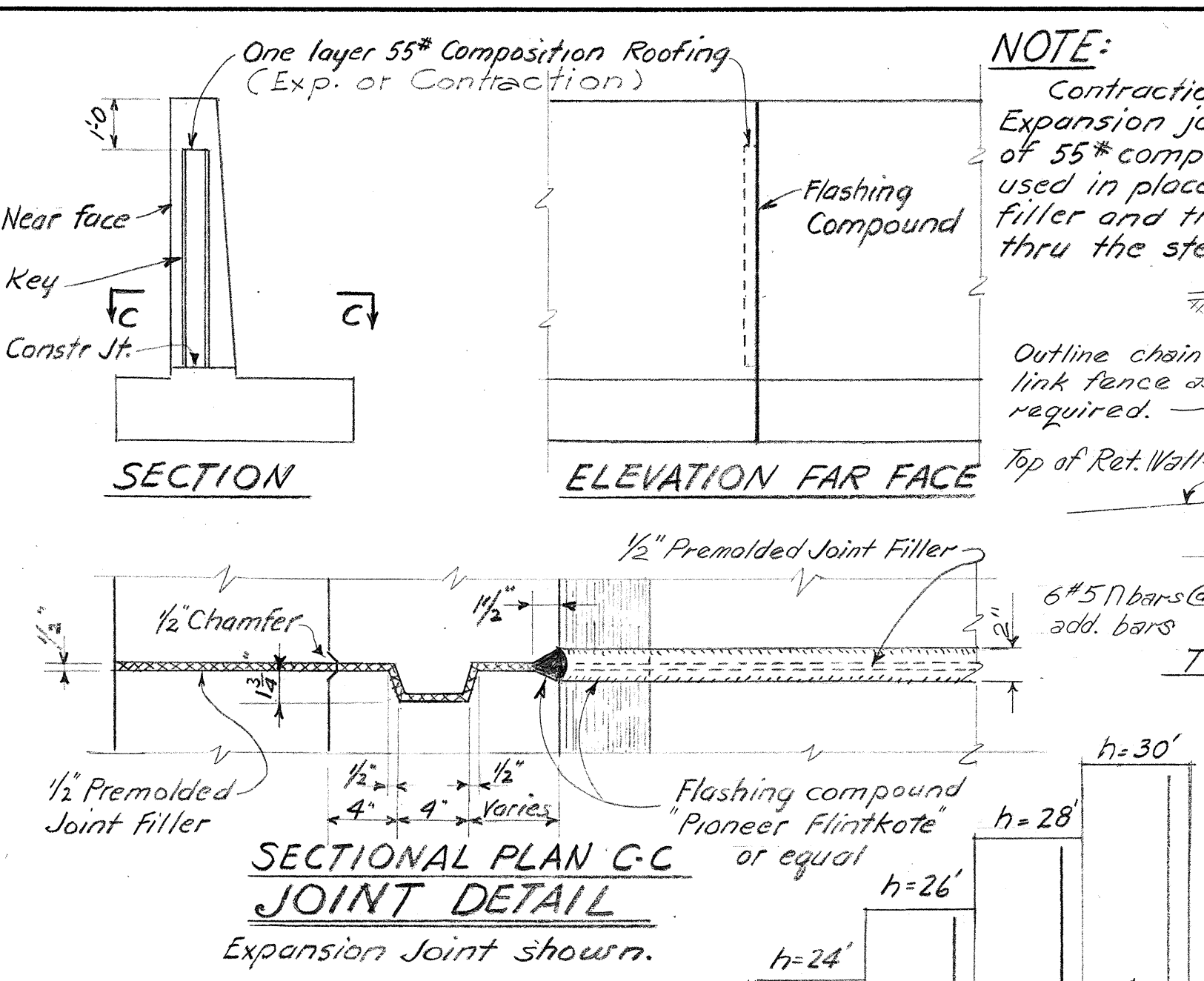
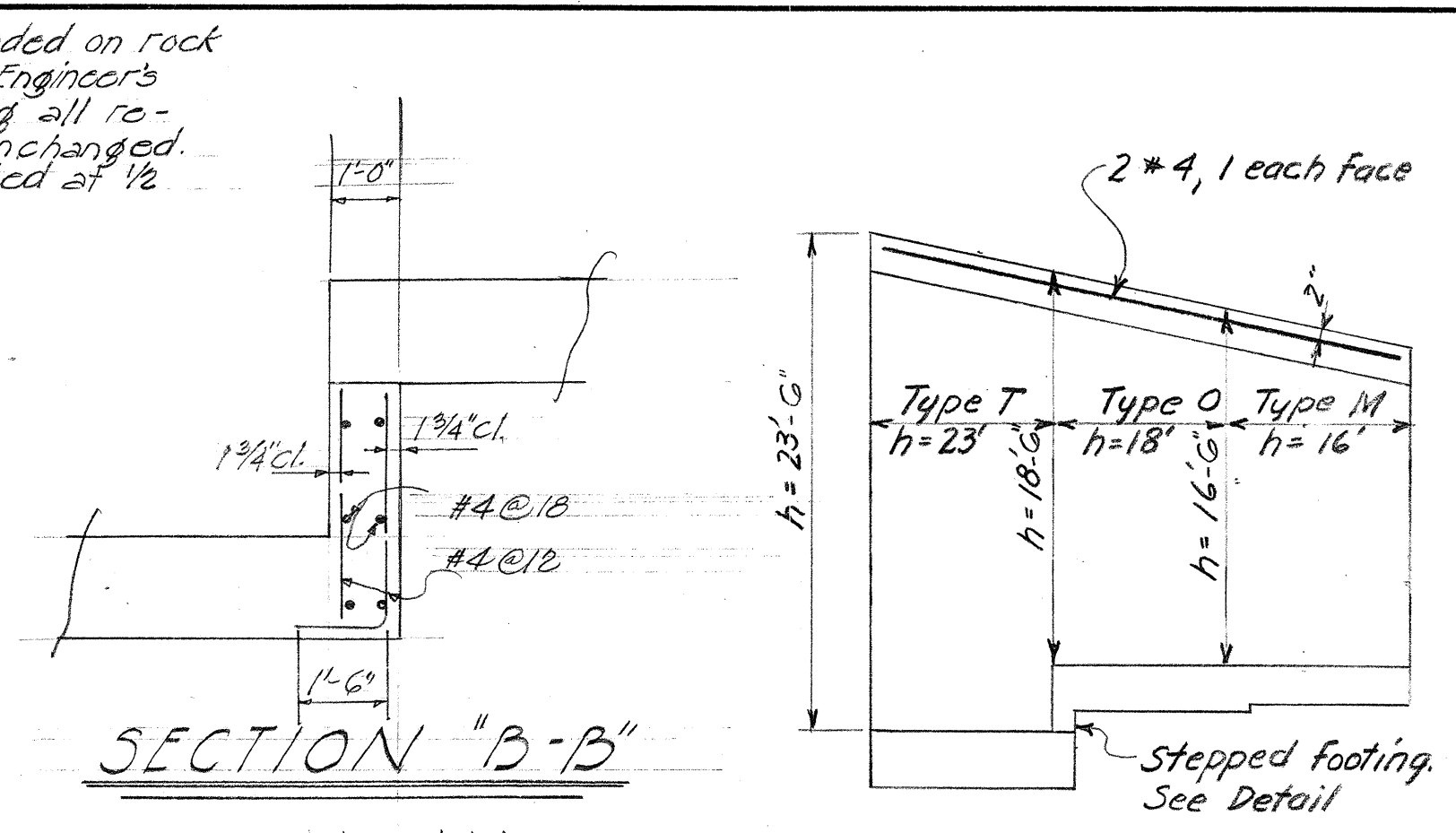
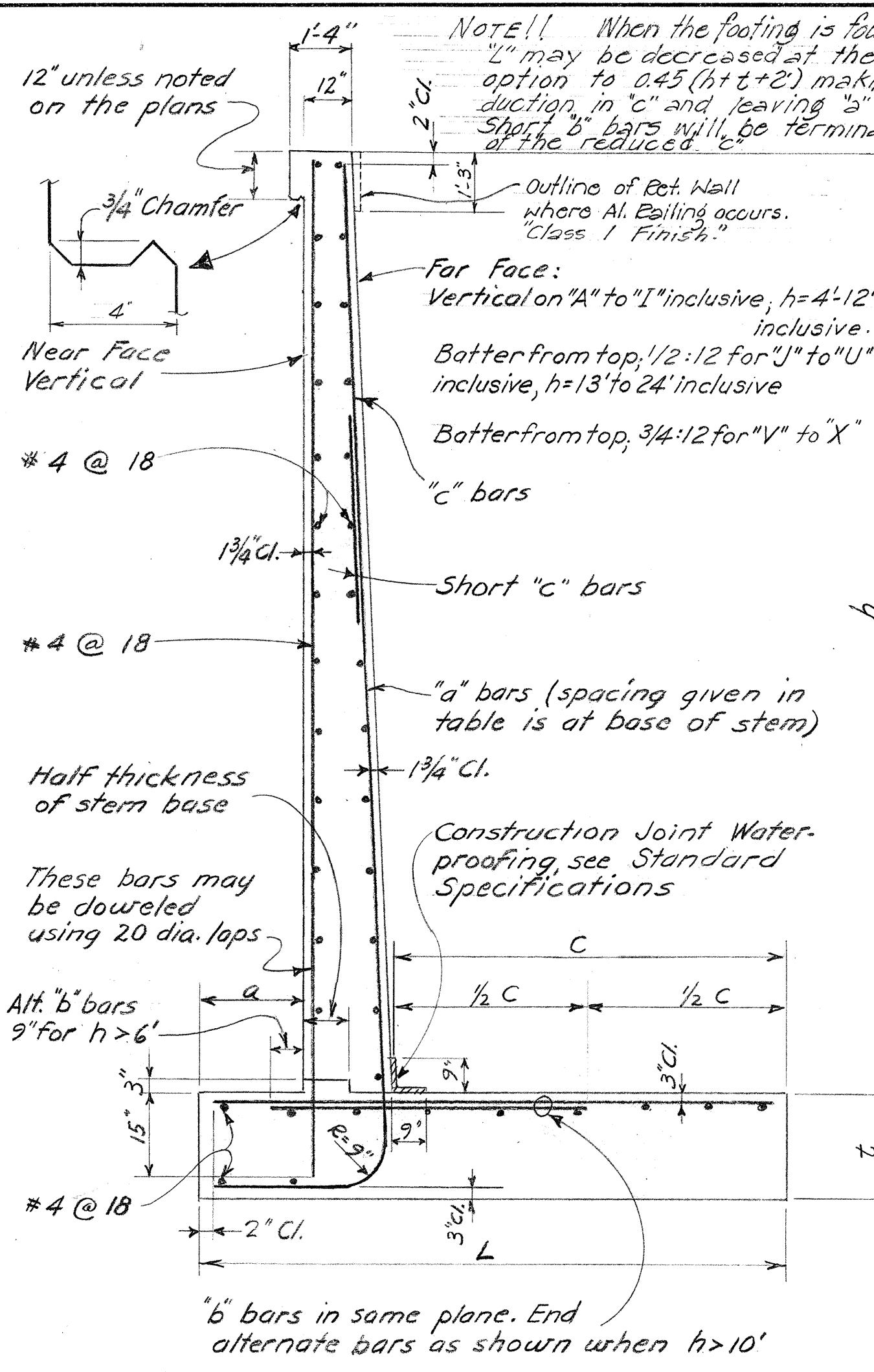
Note: Exposed surfaces of retaining wall facing freeway and/or ramp & top of wall, shall have a "Glass 1 Surface Finish." All other surfaces to receive "Ordinary Finish."



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James B. Wilson  
REGISTERED ENGINEER  
DATE JUL 3 1957

TERRITORIAL HIGHWAY DEPARTMENT  
TERRITORY OF HAWAII  
NUUANU HIGHWAY  
PROJECT NO. BU-OG-16, UNIT 4  
L-TYPE RETAINING WALL  
STRUCTURAL DETAILS  
SEPT. 1957





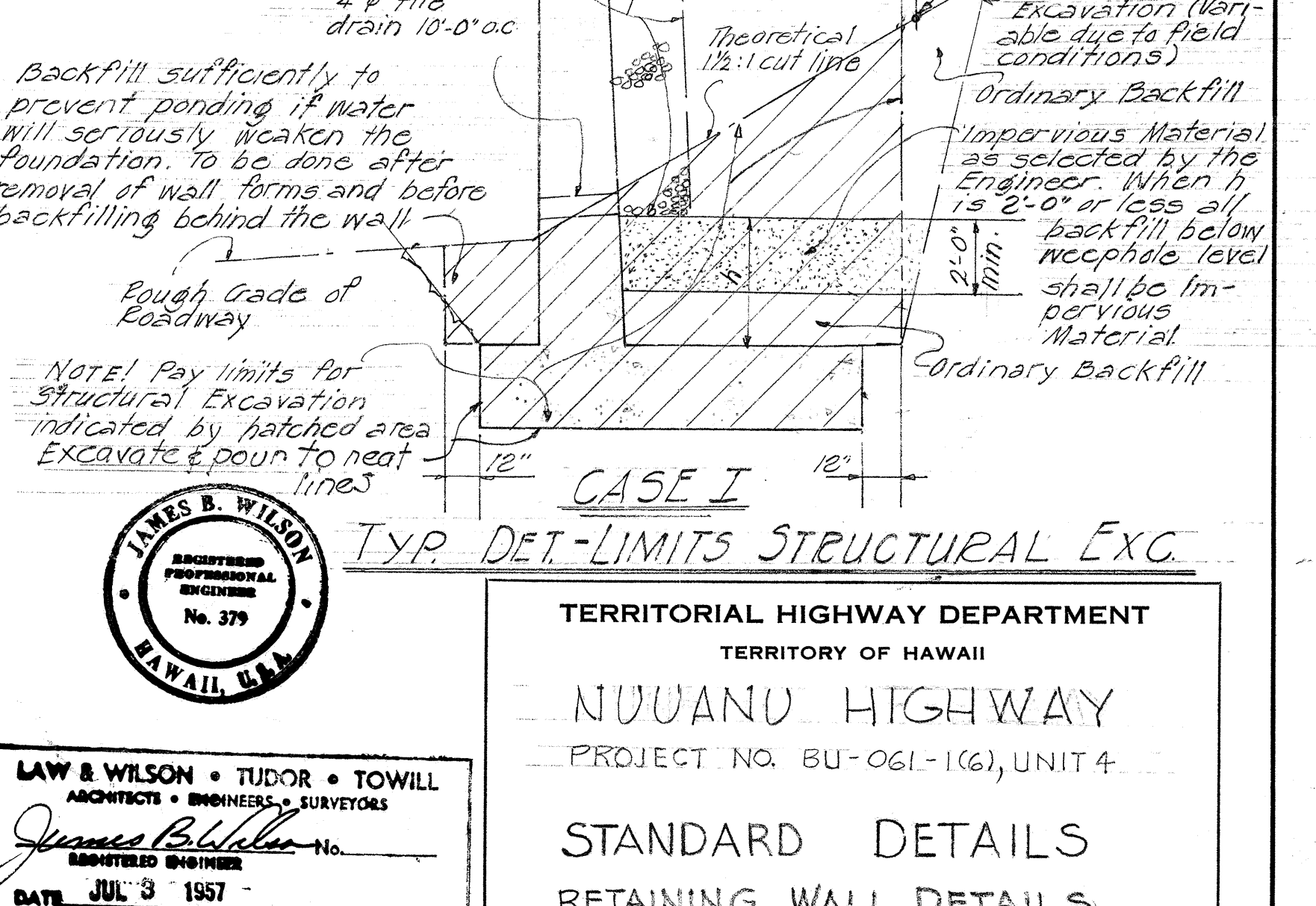
**NOTE:** Exposed surfaces of retaining wall facing freeway and/or roadway & top of wall shall have a "Class 1 Surface Finish". All other surfaces to receive "Ordinary Finish", except as otherwise noted.

**VERTICAL REINFORCING STEEL ARRANGEMENT**

**No Scale**

**TABLE OF DIMENSIONS AND REINFORCING STEEL**

| Type              | A     | B     | C     | D     | E     | F        | G     | H     | I    | J    | K     | L        | M     | N     | O     | P     | Q     | R     | S         | T      | U         | V         | W      | X      |
|-------------------|-------|-------|-------|-------|-------|----------|-------|-------|------|------|-------|----------|-------|-------|-------|-------|-------|-------|-----------|--------|-----------|-----------|--------|--------|
| Maximum h         | 4'    | 5'    | 6'    | 7'    | 8'    | 9'       | 10'   | 11'   | 12'  | 13'  | 14'   | 15'      | 16'   | 17'   | 18'   | 19'   | 20'   | 21'   | 22'       | 23'    | 24'       | 26'       | 28'    | 30'    |
| a                 | 6"    | 6"    | 6"    | 12"   | 12"   | 12"      | 12"   | 12"   | 12"  | 12"  | 15"   | 18"      | 21"   | 24"   | 24"   | 24"   | 27"   | 30"   | 33"       | 36"    | 39"       | 54"       | 60"    | 72"    |
| c                 | 1.0'  | 1.5'  | 2.0'  | 2.0'  | 2.5'  | 3.0'     | 3.5'  | 4.0'  | 4.5' | 4.4' | 4.92' | 5.13'    | 5.58' | 6.04' | 6.75' | 7.71' | 8.42' | 9.13' | 9.83'     | 10.29' | 10.75'    | 10.88'    | 12.25' | 12.12' |
| L                 | 2.5'  | 3.0'  | 3.5'  | 4.0'  | 4.5'  | 5.0'     | 5.5'  | 6.0'  | 6.5' | 7.0' | 7.75' | 8.25'    | 9.0'  | 9.75' | 10.5' | 11.5' | 12.5' | 13.5' | 14.5'     | 15.25' | 16.0'     | 18.0'     | 20.0'  | 21.0'  |
| t                 | 18"   | 18"   | 18"   | 18"   | 18"   | 18"      | 18"   | 18"   | 18"  | 18"  | 18"   | 18"      | 21"   | 21"   | 24"   | 24"   | 24"   | 27"   | 30"       | 31"    | 33"       | 36"       | 39"    | 42"    |
| "a" bars          | #3@12 | #3@12 | #4@12 | #3@6  | #4@6  | #4@5 1/2 | #5@6  | #5@5  | #6@6 | #6@8 | #6@6  | #6@5 1/2 | #6@5  | #7@6  | #7@5  | #8@6  | #8@5  | #9@6  | #9@5 1/2  | #10@6  | #10@5 1/2 | #10@5 1/2 | #10@5  | #11@5  |
| "b" bars          | #3@12 | #3@12 | #3@12 | #3@12 | #3@12 | #4@11    | #5@12 | #5@10 | #5@6 | #6@8 | #6@6  | #6@5 1/2 | #6@5  | #7@6  | #7@5  | #9@6  | #9@5  | #10@6 | #10@5 1/2 | #11@6  | #11@5 1/2 | #11@5 1/2 | #11@5  | #11@5  |
| "c" bars          | —     | —     | —     | —     | —     | —        | —     | —     | —    | —    | —     | —        | —     | —     | —     | —     | —     | —     | —         | —      | —         | —         | —      | —      |
| F.S. Sliding *    | 1.30  | 1.29  | 1.28  | 1.16  | 1.17  | 1.18     | 1.17  | 1.17  | 1.20 | 1.23 | 1.25  | 1.21     | 1.25  | 1.26  | 1.33  | 1.39  | 1.42  | 1.48  | 1.53      | 1.53   | 1.54      | 1.63      | 1.62   | 1.61   |
| F.S. Overturning  | 1.38  | 1.45  | 1.50  | 1.54  | 1.61  | 1.64     | 1.63  | 1.71  | 1.76 | 1.81 | 1.96  | 1.97     | 2.05  | 2.19  | 2.47  | 2.49  | 2.70  | 2.85  | 3.02      | 3.06   | 3.11      | 3.70      | 3.61   | 3.60   |
| Concrete c.y./ft. | 0.29  | 0.35  | 0.42  | 0.48  | 0.55  | 0.61     | 0.68  | 0.74  | 0.81 | 1.00 | 1.10  | 1.19     | 1.37  | 1.49  | 1.69  | 1.83  | 1.97  | 2.26  | 2.53      | 2.72   | 2.97      | 3.75      | 4.36   | 4.87   |
| Steel lbs/ft.     | 11.1  | 13.8  | 18.3  | 20.5  | 27.8  | 33.4     | 44.7  | 51.0  | 67.7 | 59.6 | 76.2  | 87.8     | 103.7 | 125.8 | 145.4 | 178.3 | 222.7 | 249.2 | 278.4     | 339.0  | 376.6     | 426.0     | 564.0  | 622.0  |
| Eccentricity e    | 0.88' | 1.01' | 1.14' | 1.21' | 1.20  | 1.42     | 1.63  | 1.63  | 1.74 | 1.83 | 1.83  | 1.89     | 1.93  | 1.89  | 1.98  | 1.94  | 1.86  | 2.00  | 1.75      | 1.82   | 1.82      | 1.29      | 1.52   | 1.31   |
| Toe Pressure      | 2800  | 2600  | 3200  | 2800  | 2900  | 3200     | 3700  | 3600  | 3800 | 4100 | 3800  | 3900     | 3900  | 3800  | 3800  | 4000  | 3900  | 4100  | 3900      | 4100   | 4100      | 3850      | 3960   | 4030   |



\* F.S. Against sliding based on friction factor of 0.40

\* F.S. Against sliding based on friction factor of 0.40

\* F.S. Against sliding based on friction factor of 0.40

\* F.S. Against sliding based on friction factor of 0.40