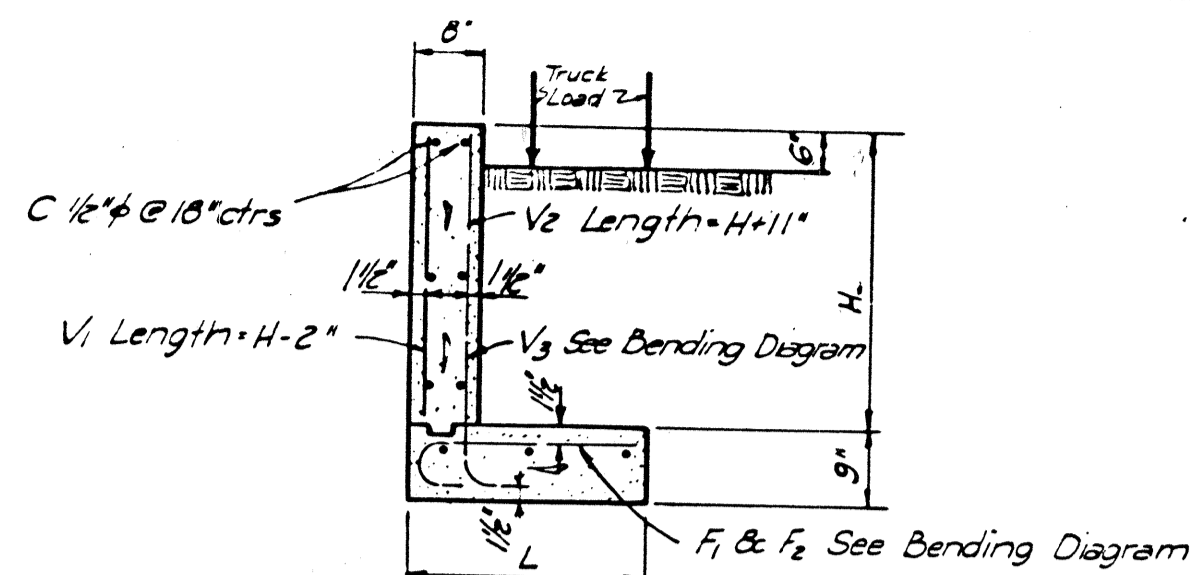


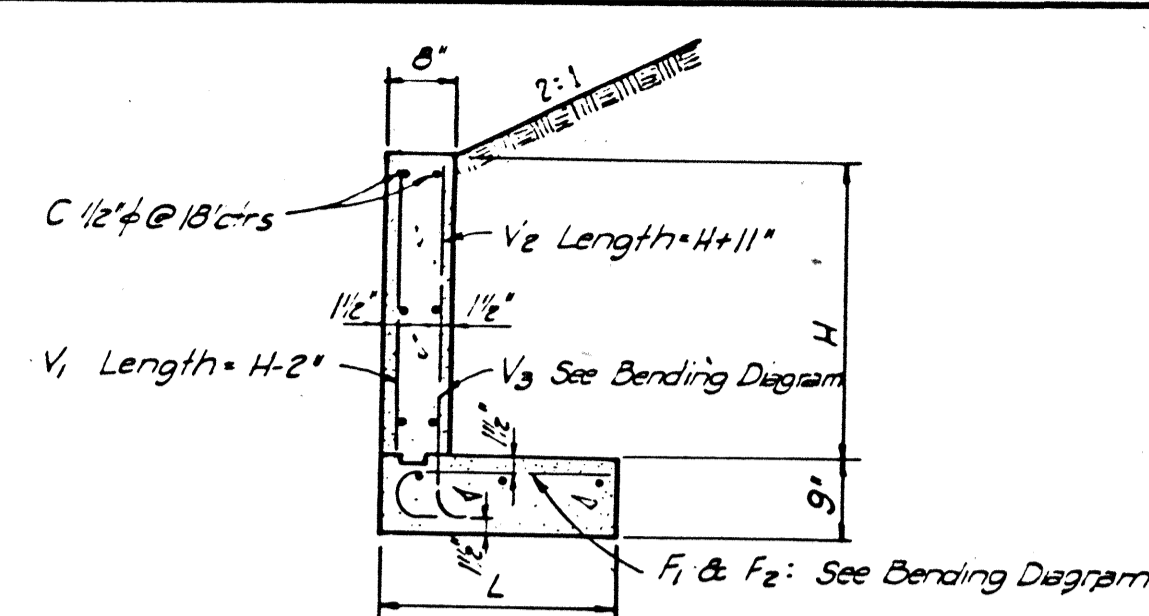
TYPE I A

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|-------|---------------|--------|------------|----------------------------|---------------------|-------|
| | | | F1 Bar | F2 Bar | C Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.105 |
| 3 | 3'-0" | 2'-7" | 1/2" @ 12" | 8 | 1/2" @ 18" | 1/2" @ 12" | 11.11 | 0.146 |
| 4 | 4'-0" | 3'-3" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.34 | 0.189 |
| 5 | 5'-0" | 4'-0" | 1/2" @ 12" | 11 | 1/2" @ 18" | 1/2" @ 12" | 16.29 | 0.235 |
| 6 | 6'-0" | 4'-9" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 22.00 | 0.278 |
| 7 | 7'-0" | 5'-4" | 1/2" @ 12" | 17 | 1/2" @ 18" | 1/2" @ 12" | 27.76 | 0.321 |
| 8 | 8'-0" | 6'-0" | 1/2" @ 12" | 19 | 1/2" @ 18" | 1/2" @ 12" | 40.67 | 0.364 |
| 9 | 9'-0" | 6'-9" | 1/2" @ 12" | 21 | 1/2" @ 18" | 1/2" @ 12" | 57.51 | 0.407 |



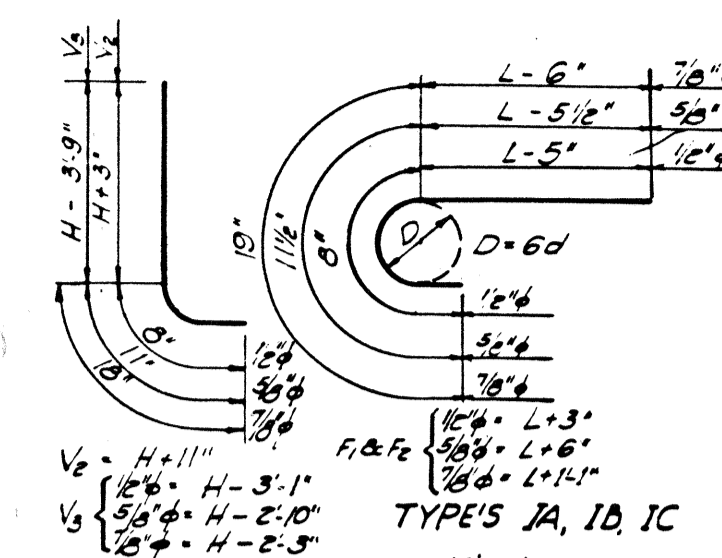
TYPE I B

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|--------|---------------|--------|------------|----------------------------|---------------------|-------|
| | | | F1 Bar | F2 Bar | C Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.105 |
| 3 | 3'-0" | 2'-10" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 11.95 | 0.153 |
| 4 | 4'-0" | 3'-7" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.56 | 0.198 |
| 5 | 5'-0" | 4'-4" | 1/2" @ 12" | 12 | 1/2" @ 18" | 1/2" @ 12" | 19.16 | 0.244 |
| 6 | 6'-0" | 5'-1" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 25.64 | 0.289 |
| 7 | 7'-0" | 5'-10" | 1/2" @ 12" | 15 | 1/2" @ 18" | 1/2" @ 12" | 36.83 | 0.335 |
| 8 | 8'-0" | 6'-7" | 1/2" @ 12" | 17 | 1/2" @ 18" | 1/2" @ 12" | 52.79 | 0.380 |



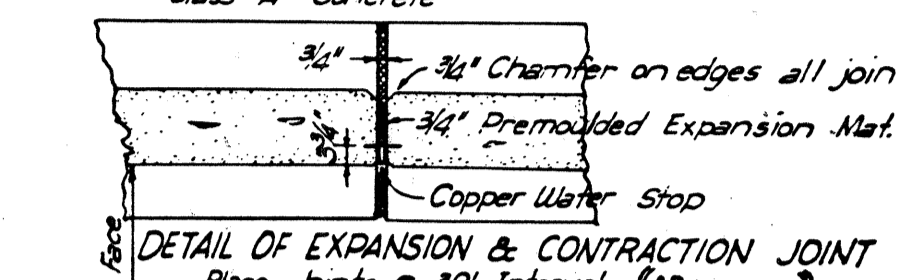
TYPE I C

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|--------|---------------|--------|------------|----------------------------|---------------------|-------|
| | | | F1 Bar | F2 Bar | C Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.105 |
| 3 | 3'-0" | 2'-7" | 1/2" @ 12" | 8 | 1/2" @ 18" | 1/2" @ 12" | 11.11 | 0.146 |
| 4 | 4'-0" | 3'-4" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.40 | 0.191 |
| 5 | 5'-0" | 4'-1" | 1/2" @ 12" | 11 | 1/2" @ 18" | 1/2" @ 12" | 18.23 | 0.237 |
| 6 | 6'-0" | 4'-11" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 27.62 | 0.285 |
| 7 | 7'-0" | 5'-8" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 39.78 | 0.330 |



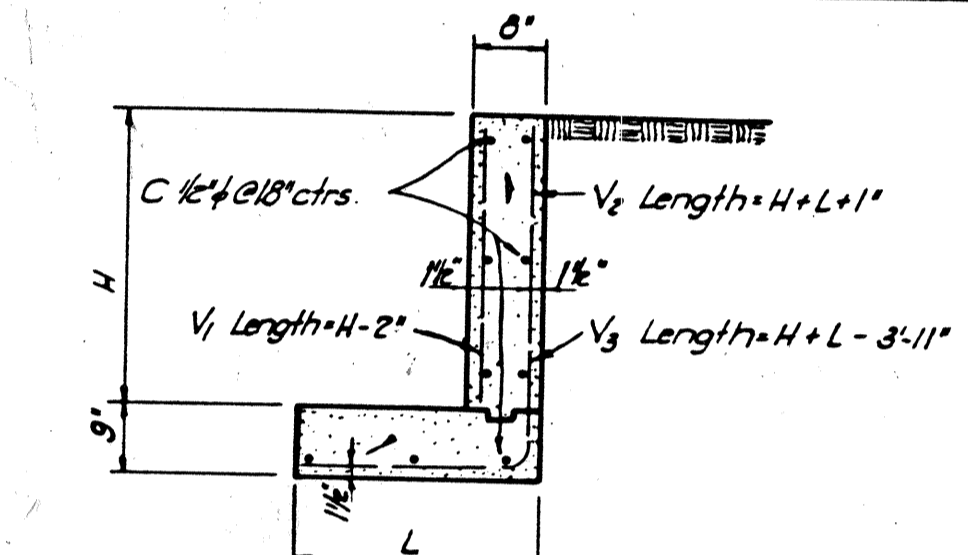
| DESCRIPTION | REVISIONS | DATE |
|-------------|-----------|------|
| RE-ISSUE | | |

DETAIL OF COPPER WATER STOP
 Notes: Copper water stop shall be installed. All height of wall in all vertical expansion joints. All cast including Preplaced Expansion Material shall be included in the unit price bid for Class "A" Concrete.



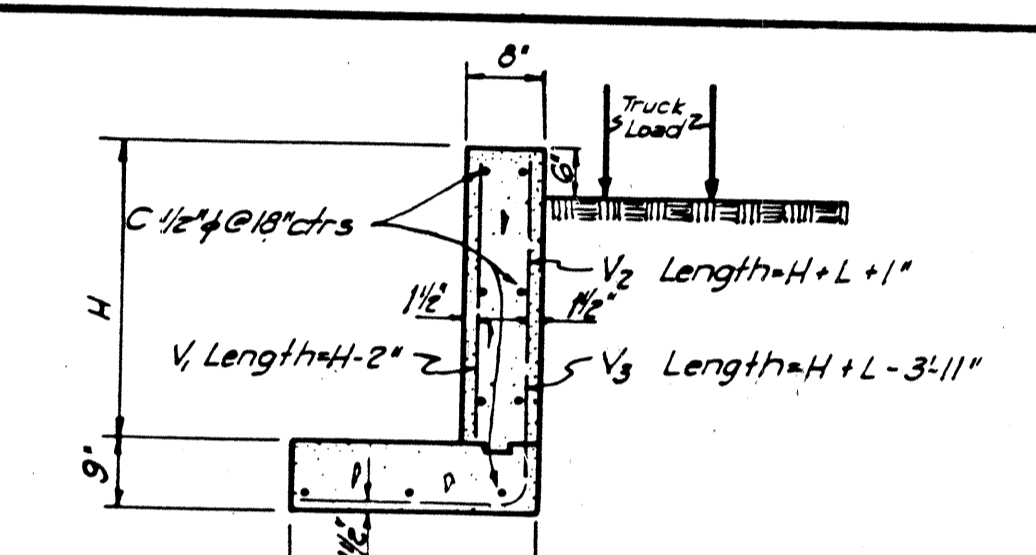
DETAIL OF EXPANSION & CONTRACTION JOINT
 Place joints @ 30' Intervals Maximum

TYPICAL DETAIL OF KEEP HOLES & CONSTRUCTION JOINT
 2" Dia. Keep Holes 10'-0" on centers. Pipe or formed hole.



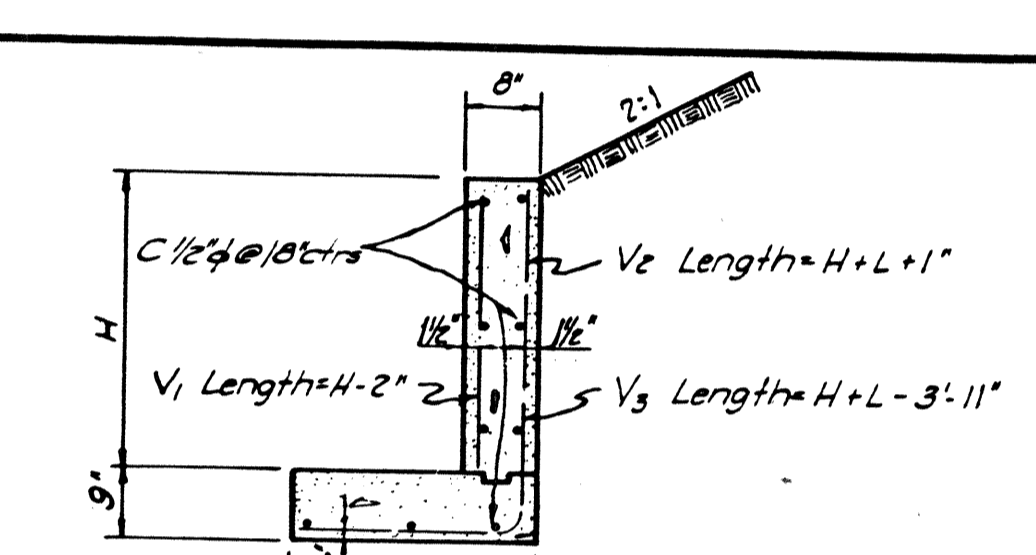
TYPE II A

| Design No. | H | L | Reinforcement | | | Quantities | |
|------------|-------|--------|---------------|------------|------------|----------------------------|---------------------|
| | | | C Bar | V1 Bar | V2 Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. |
| 2 | 2'-0" | 2'-0" | 6 | 1/2" @ 18" | 1/2" @ 12" | 7.55 | 0.105 |
| 3 | 3'-0" | 2'-7" | 8 | 1/2" @ 18" | 1/2" @ 12" | 10.06 | 0.132 |
| 4 | 4'-0" | 2'-11" | 9 | 1/2" @ 18" | 1/2" @ 12" | 12.40 | 0.180 |
| 5 | 5'-0" | 3'-11" | 11 | 1/2" @ 18" | 1/2" @ 12" | 15.51 | 0.232 |
| 6 | 6'-0" | 5'-1" | 14 | 1/2" @ 18" | 1/2" @ 12" | 24.20 | 0.289 |
| 7 | 7'-0" | 6'-5" | 15 | 1/2" @ 18" | 1/2" @ 12" | 31.99 | 0.351 |
| 8 | 8'-0" | 7'-10" | 18 | 1/2" @ 18" | 1/2" @ 12" | 44.04 | 0.415 |



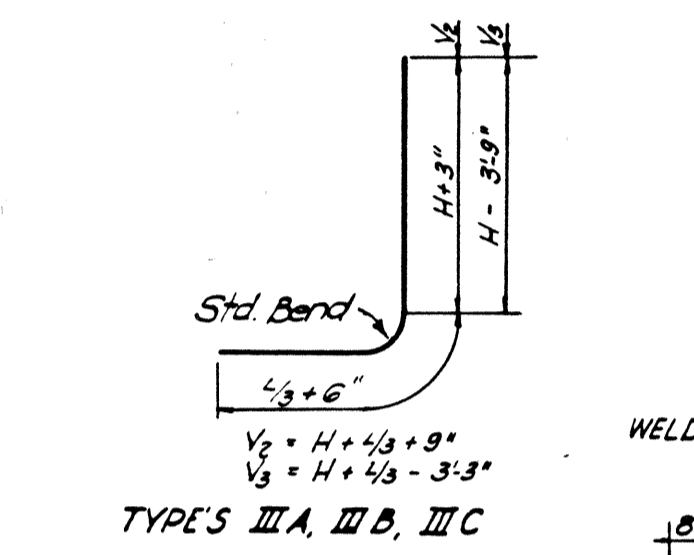
TYPE II B

| Design No. | H | L | Reinforcement | | | Quantities | |
|------------|-------|-------|---------------|------------|------------|----------------------------|---------------------|
| | | | C Bar | V1 Bar | V2 Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. |
| 2 | 2'-0" | 2'-2" | 6 | 1/2" @ 18" | 1/2" @ 12" | 7.66 | 0.110 |
| 3 | 3'-0" | 3'-3" | 9 | 1/2" @ 18" | 1/2" @ 12" | 11.50 | 0.164 |
| 4 | 4'-0" | 4'-5" | 10 | 1/2" @ 18" | 1/2" @ 12" | 14.07 | 0.221 |
| 5 | 5'-0" | 5'-8" | 12 | 1/2" @ 18" | 1/2" @ 12" | 21.86 | 0.281 |
| 6 | 6'-0" | 7'-2" | 15 | 1/2" @ 18" | 1/2" @ 12" | 31.12 | 0.347 |
| 7 | 7'-0" | 8'-8" | 16 | 1/2" @ 18" | 1/2" @ 12" | 41.90 | 0.414 |



TYPE II C

| Design No. | H | L | Reinforcement | | | Quantities | |
|------------|-------|--------|---------------|------------|------------|----------------------------|---------------------|
| | | | C Bar | V1 Bar | V2 Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. |
| 2 | 2'-0" | 2'-0" | 6 | 1/2" @ 18" | 1/2" @ 12" | 7.55 | 0.105 |
| 3 | 3'-0" | 2'-7" | 8 | 1/2" @ 18" | 1/2" @ 12" | 10.39 | 0.146 |
| 4 | 4'-0" | 3'-8" | 9 | 1/2" @ 18" | 1/2" @ 12" | 12.90 | 0.201 |
| 5 | 5'-0" | 4'-11" | 12 | 1/2" @ 18" | 1/2" @ 12" | 20.86 | 0.260 |
| 6 | 6'-0" | 6'-4" | 15 | 1/2" @ 18" | 1/2" @ 12" | 26.53 | 0.324 |
| 7 | 7'-0" | 8'-0" | 16 | 1/2" @ 18" | 1/2" @ 12" | 40.45 | 0.395 |

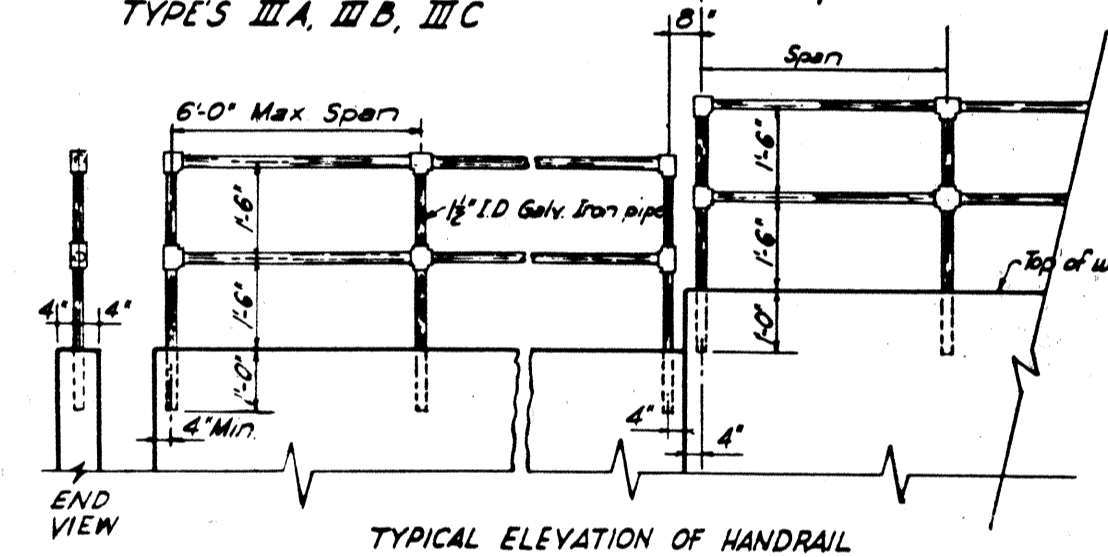


WELDED CONNECTIONS OPTIONAL

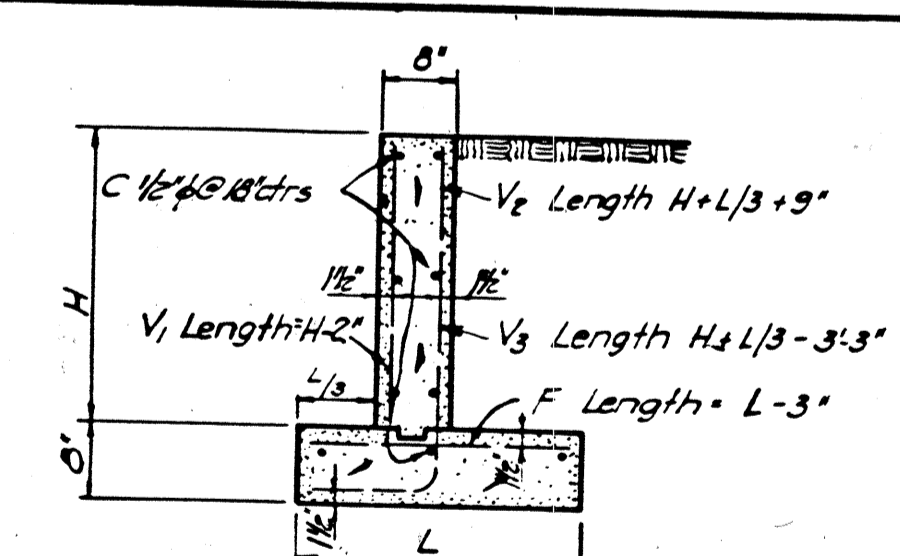
Handrail Note
 Pipe handrail shall be placed on retaining walls only when called for on the Plans.

Std. Steel Pipe painted two coats of aluminum paint may be used in place of galv. iron pipe.

Shop details for all pipe handrail shall be submitted for approval by the Bridge Engineer.

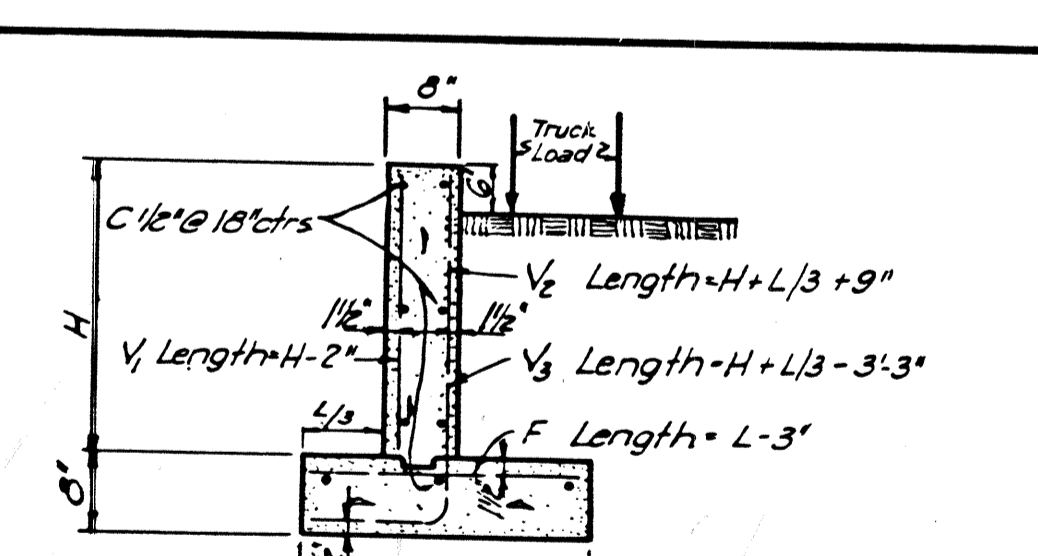


TYPICAL ELEVATION OF HANDRAIL



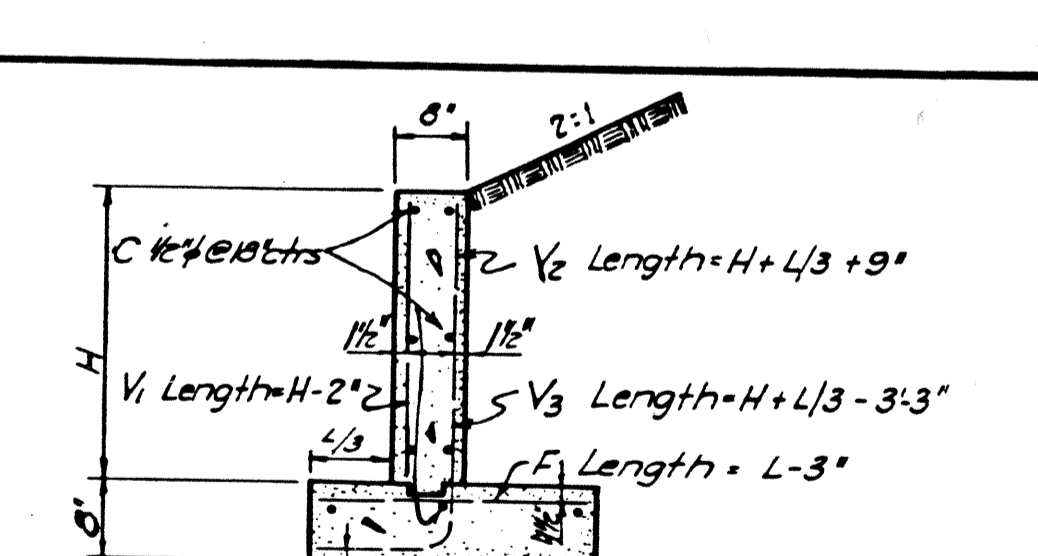
TYPE III A

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|--------|---------------|-------|------------|----------------------------|---------------------|-------|
| | | | F Bar | C Bar | V Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.099 |
| 3 | 3'-0" | 2'-0" | 1/2" @ 12" | 8 | 1/2" @ 18" | 1/2" @ 12" | 10.73 | 0.123 |
| 4 | 4'-0" | 2'-8" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.10 | 0.165 |
| 5 | 5'-0" | 3'-3" | 1/2" @ 12" | 11 | 1/2" @ 18" | 1/2" @ 12" | 16.07 | 0.204 |
| 6 | 6'-0" | 3'-10" | 1/2" @ 12" | 13 | 1/2" @ 18" | 1/2" @ 12" | 19.04 | 0.243 |
| 7 | 7'-0" | 4'-5" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 26.40 | 0.282 |
| 8 | 8'-0" | 5'-0" | 1/2" @ 12" | 16 | 1/2" @ 18" | 1/2" @ 12" | 34.17 | 0.321 |
| 9 | 9'-0" | 5'-7" | 1/2" @ 12" | 19 | 1/2" @ 18" | 1/2" @ 12" | 50.84 | 0.360 |



TYPE III B

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|--------|---------------|-------|------------|----------------------------|---------------------|-------|
| | | | F Bar | C Bar | V Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.099 |
| 3 | 3'-0" | 2'-5" | 1/2" @ 12" | 8 | 1/2" @ 18" | 1/2" @ 12" | 11.10 | 0.134 |
| 4 | 4'-0" | 3'-1" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.47 | 0.175 |
| 5 | 5'-0" | 3'-9" | 1/2" @ 12" | 11 | 1/2" @ 18" | 1/2" @ 12" | 16.51 | 0.216 |
| 6 | 6'-0" | 4'-4" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 24.48 | 0.255 |
| 7 | 7'-0" | 4'-11" | 1/2" @ 12" | 16 | 1/2" @ 18" | 1/2" @ 12" | 30.52 | 0.294 |
| 8 | 8'-0" | 5'-7" | 1/2" @ 12" | 17 | 1/2" @ 18" | 1/2" @ 12" | 46.35 | 0.335 |



TYPE III C

| Design No. | H | L | Reinforcement | | | Quantities | | |
|------------|-------|-------|---------------|-------|------------|----------------------------|---------------------|-------|
| | | | F Bar | C Bar | V Bar | Rein. Steel (lbs per L.F.) | Conc. C.Y. per L.F. | |
| 2 | 2'-0" | 2'-0" | 1/2" @ 12" | 6 | 1/2" @ 18" | 1/2" @ 12" | 0.28 | 0.099 |
| 3 | 3'-0" | 2'-0" | 1/2" @ 12" | 8 | 1/2" @ 18" | 1/2" @ 12" | 10.73 | 0.123 |
| 4 | 4'-0" | 2'-7" | 1/2" @ 12" | 9 | 1/2" @ 18" | 1/2" @ 12" | 13.03 | 0.163 |
| 5 | 5'-0" | 3'-2" | 1/2" @ 12" | 11 | 1/2" @ 18" | 1/2" @ 12" | 15.99 | 0.202 |
| 6 | 6'-0" | 3'-9" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 22.95 | 0.241 |
| 7 | 7'-0" | 4'-5" | 1/2" @ 12" | 14 | 1/2" @ 18" | 1/2" @ 12" | 30.26 | 0.282 |
| 8 | 8'-0" | 5'-0" | 1/2" @ 12" | 16 | 1/2" @ 18" | 1/2" @ 12" | 49.46 | 0.321 |

GENERAL NOTES

ALL CONSTRUCTION AND MATERIAL REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL EXPOSED CONCRETE EDGES SHALL HAVE A 3/4 INCH CHAMFER.

ALL CONCRETE SHALL BE CLASS A CONCRETE.

EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM OF 30'-0" INTERVALS.

ALL REINFORCING STEEL BARS SHALL BE DEFORMED BARS, COLD BENT, NO WELDS PERMITTED.

VARIATION IN HEIGHT OF RETAINING WALL SHALL BE OBTAINED IN 12 INCH STEPS.

PLACE PIPE UNDERDRAIN BACK OF RETAINING WALLS AS SHOWN ON STD. PUD-1.

UNLESS OTHERWISE SPECIFIED, ALL EXPOSED CONCRETE SURFACES SHALL HAVE A FINISH IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

APPROVED BY

RURAL DES. ENGR. URBAN DES. ENGR. BRIDGE ENGINEER GEOMAT. ENGINEER ASS'T. DIR. / DES.

DATE 12-9-88 DATE 12-12-88 DATE 12-14-88 DATE 12-28-88 DATE 12-28-88

DESIGN DRAWN CHECKED SQUAD RURAL/URBAN DESIGN

OKLAHOMA DEPT. OF TRANSPORTATION STANDARD

RETAINING WALLS

1988 SPECIFICATIONS

212/89