

MISSISSIPPI DEPARTMENT OF TRANSPORTATION

Inter-Departmental Memorandum

TO: Squad Leaders

DATE: November 20, 1995

FROM: Steven W. Reeves
Quality Control Engineer

SUBJECT OR PROJECT NO: Squad Notes

INFORMATION COPY TO:

COUNTY:

Files
John Pickering
Irving Harris
Section Leaders

Please find attached a list of common design practices that all Squads need to start using in their plans. There are also copies of different work sheets that may help you in the calculation of quantities.

If you have any questions, please advise.

SWR/swr

SQUAD LEADER NOTES

1. GENERAL NOTES: A CADD FILE HAS BEEN OR WILL BE SET UP WITH THE MOST COMMONLY USED GENERAL NOTES. A COPY OF THESE IS INCLUDED IN YOUR PACKET. WHEN USING THESE GENERAL NOTES, PLEASE DO NOT MODIFY THE WORDING SO THAT WE CAN MAINTAIN CONSISTENCY BETWEEN PROJECTS AND DESIGN SQUADS.

2. CHECK PRINTS: ALL PLANS SHOULD COME THROUGH THE QUALITY CONTROL OFFICE. THE PREFERRED TIME TO HAVE US CHECK YOUR PLANS IS EITHER BEFORE THE OFFICE REVIEW OR IMMEDIATELY AFTER THE OFFICE REVIEW COMMENTS HAVE BEEN ADDED TO THE PLANS.

3. TYPICAL SECTIONS:
 - A. EXAGGERATE THE DEPTH OF ASPHALT LIFTS TO CLARIFY DRAWINGS

 - B. USE BARS TO DESIGNATE LIFTS, NOT ARROWS

 - C. SHOW DESIGNATION OF SUBBASE GRANULAR MATERIAL UNDER THE PAVEMENT, NOT UNDER THE SHOULDER OR SLOPE

 - D. GRANULAR MATERIAL DESIGNATION SHOULD BE SHOWN THROUGH THE LIME-FLYASH COURSE

 - E. SHOW PLAN GRADE LOCATION ON ALL TYPICAL SECTIONS

 - F. SHOW STRUCTURE THICKNESS ON ALL TYPICALS

(EXAMPLES ENCLOSED OF ALL OF THE ABOVE)

4. GRADE DIFFERENCES: ANY TIME NEW CONSTRUCTION AREAS TIE TO EXISTING PAVEMENT, CHECK GRADE DIFFERENCES TO INSURE THAT THE DIFFERENCE IN GRADE DOES NOT INTERFERE WITH CONSTRUCTION.

5. OVERLAYS: WHEN TYING AN OVERLAY DOWN TO AN EXISTING GRADE USE 1" PER 100 FT AS A GO BY. EXAMPLE ENCLOSED WITH PACKET.

6. PIPES: SEPARATE ALL PIPES ACCORDING TO SIZE, CLASS, TYPE OF BEDDING AND TYPE OF BACKFILL.(ex. CL III, CL. IV, CL. V, IMPERFECT TRENCH, CLASS B BEDDING, etc.)

7. PAY ITEM 202-B REMOVAL OF BRIDGE FOOTING: ANY TIME YOU HAVE A NEW BRIDGE BEING BUILT IN THE SAME LOCATION AS THE EXISTING BRIDGE CONTACT BRIDGE DIVISION ABOUT THE USE OF THIS PAY ITEM. WHEN USING THIS PAY ITEM, FOOTNOTE THE BRIDGE STATION AND THE BENT NO. ON THE SUMMARY OF QUANTITY SHEET.
8. TEC-1: ALL PROJECTS IN DISTRICT 5 WILL NEED A NEW SPECIAL DESIGN SHEET TEC-1. THE SHEETS ARE AVAILABLE IN THE QUALITY CONTROL OFFICE.
9. GRANULAR MATERIAL AEA: WHEN CALCULATING QUANTITIES FOR GRAN. MATERIAL SHOW ALL WORK. STATIONS SHOULD BE USED TO SHOW LIMITS. THE DEGREE OF CURVE, SUPERELEVATION RATE, CURVE TO LEFT OR RIGHT SHOULD ALL BE SHOWN IN CALCULATIONS. YOUR WORK SHEETS NEED TO BE SUITABLE TO BE FOLLOWED BY ANYONE NEEDING TO OBTAIN INFORMATION OFF OF THEM. A WORKSHEET IS ENCLOSED TO BE USED WITH THE COMPUTER PROGRAM DEVELOPED BY KEITH PURVIS.
10. SILT BASINS: TYPE A AND TYPE B SILT BASINS ARE BOTH TO BE SHOWN ON SUMMARY OF QUANTITY SHEET. THE TYPE B SILT BASIN WILL BE SHOWN ON ROW OR EASEMENT ACCORDING TO YOUR DISTRICT SECTION LEADER.
11. BOX CULVERTS:
 1. IF THE BOX IS TO BE CALCULATED USING LOW OR HIGH COVER, STATE THIS ON THE ESTIMATED QUANTITY SHEET AND THE PLAN/PROFILE SHEETS.
 2. FOOTNOTE ANY REINFORCEMENT OR CONCRETE QUANTITY THAT IS OBTAINED FROM A BOX BEND OR A DROP IN FLOWLINE OR ANY OTHER ADJUSTMENT TO THE BOX.
 3. DISTRICTS 1 AND 2 DO NOT USE J SLABS OR THE ICX-1 COLLAR. PLEASE USE FULL COLLARS WHEN CALCULATING QUANTITIES FOR THESE TWO DISTRICTS.
 4. NEW WORKSHEET FOR BOXES IS ENCLOSED IN PACKET.
12. BRIDGE END PAVEMENT: WORKSHEET ENCLOSED IN PACKET.

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13. EROSION CONTROL ITEMS: ALL EROSION CONTROL ITEMS SHOULD BE SHOWN ON A PAGE BY PAGE SUMMARY BY USING THE PAGE BLOCKS PROVIDED BY CADD OR BY STICK ONS. SILT FENCE AND HAY BALES SHOULD ALSO BE SHOWN ON A PAGE BY PAGE SUMMARY.
14. EARTHWORK: EARTHWORK SHOULD BE SUMMARIZED ON EACH PAGE AND A PROJECT TOTAL GIVEN ON THE LAST PAGE. ALL EARTHWORK NEEDS TO BE CHECKED CAREFULLY TO ELIMINATE ANY CROSS-HAUL.
15. HYDRAULIC DESIGN DATA: THIS SHEET IS TO BE ADDED TO ALL FEDERAL AID PROJECTS. AN EXAMPLE IS SHOWN IN YOUR DESIGN MANUAL ON PAGE 7 OF CHAPTER 7.

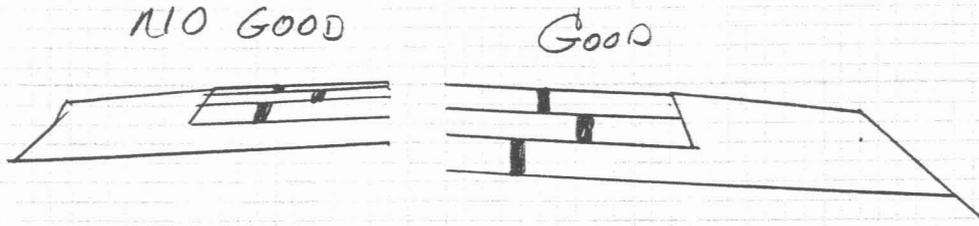
GENERAL NOTES

- THE LOCATION AND SPACING OF SIGNS, SHOWN ON THE TRAFFIC CONTROL PLANS, ARE APPROXIMATE AND MAY BE ADJUSTED AS NECESSARY TO FIT FIELD CONDITIONS.
2. TOE WALLS ARE REQUIRED AT ALL UPSTREAM AND DOWNSTREAM FLARED END SECTIONS, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 3. PRIOR TO POURING PAVED ISLANDS THE TRAFFIC ENGINEERING DIVISION SHOULD BE NOTIFIED SO THAT SIGNS REQUIRED IN ISLANDS CAN BE LOCATED.
 4. A SOIL PROFILE HAS BEEN PREPARED FOR THIS PROJECT USING SAMPLES TAKEN FROM HOLES AT THE LOCATIONS INDICATED IN THE TEST REPORTS. THIS SOIL PROFILE IS ON FILE IN THE DISTRICT AND CENTRAL CONSTRUCTION OFFICES AND IS AVAILABLE FOR EXAMINATION. THE DEPARTMENT DOES NOT GUARANTEE THAT THE MATERIALS AS SHOWN IN THE REPORTS ARE NECESSARILY TO BE FOUND OUTSIDE THE TEST HOLES.
 5. _____% SHRINKAGE FACTOR AND THE BALANCE POINTS USED IN THE EARTHWORK DIAGRAMS ARE FOR DESIGN ESTIMATING PURPOSES ONLY.
 6. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT EXISTING STRUCTURES SUCH AS PIPES, INLETS, APRONS, BRIDGES, ETC. FROM DAMAGE WHICH MIGHT OCCUR DURING CONSTRUCTION. EXTREME CARE SHOULD BE EXERCISED IN UNDERCUT AREAS AND THE UNDERCUT DEPTH MAY BE ADJUSTED AT CROSS DRAINS, AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHALL REPLACE OR REPAIR, AS DIRECTED BY THE ENGINEER, ANY STRUCTURES DAMAGED DURING THE LIFE OF THE CONTRACT. NO PAYMENT WILL BE MADE FOR REPLACEMENT OR REPAIR OF DAMAGED ITEMS.
 7. ALL EXISTING CULVERT PIPES OR OTHER OBSTRUCTIONS WHICH CONFLICT WITH REQUIRED CONSTRUCTION SHALL BE REMOVED AT THE CONTRACTOR'S EXPENSE AS AN ABSORBED ITEM. EXISTING PIPES THAT ARE TO BE ABANDONED IN PLACE SHALL BE PLUGGED ON EACH END WITH CONCRETE. (ABSORBED ITEM)

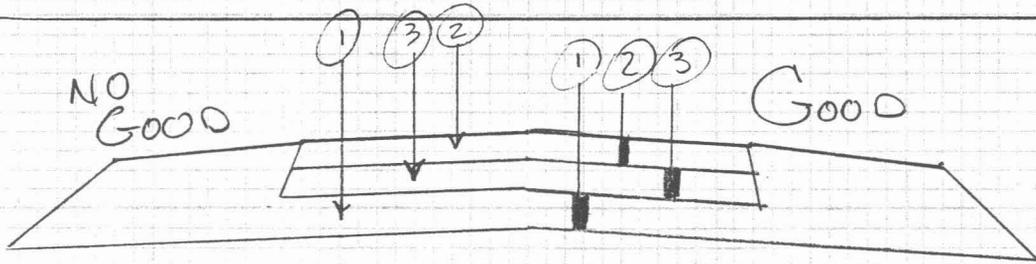
*****THIS NOTE SHOULD BE PLACED ON SUMMARY OF QUANTITY SHEET*****
 8. EROSION CHECKS: QUANTITY ESTIMATED ON THE BASIS OF 4 BALES PER EVERY 25 TO 100 L.F. OF DITCH, 8 BALES PER INLET AND 4 BALES AT EACH PIPE OUTLET. THIS IS REQUIRED AS A TEMPORARY EROSION CONTROL MEASURE TO MINIMIZE SILTATION UNTIL PERMANENT MEASURES ARE INSTALLED. THE ENGINEER WILL DETERMINE THE ACTUAL LOCATION AND NUMBER OF BALES DURING THE CONSTRUCTION OF THE PROJECT. (SEE WK. NO. TEC-1 FOR DETAILS)
 9. ALL SIZES OF FLARED ENDS MAY BE FURNISHED WITH EITHER BELL & SPIGOT OR TONGUE AND GROOVE JOINTS.
 10. VOIDS CREATED BY THE REMOVAL OF POSTS, CONCRETE ANCHORS, FOOTINGS, ETC., SHALL BE BACKFILLED AND TAMPED IN ACCORDANCE WITH SECTION 203 OF THE MISSISSIPPI STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

A TYPE "A" MEDIAN SILT BASIN WILL BE REQUIRED UPSTREAM OF EACH MEDIAN INLET.(SEE WK. NO. TEC-2 FOR DETAILS)

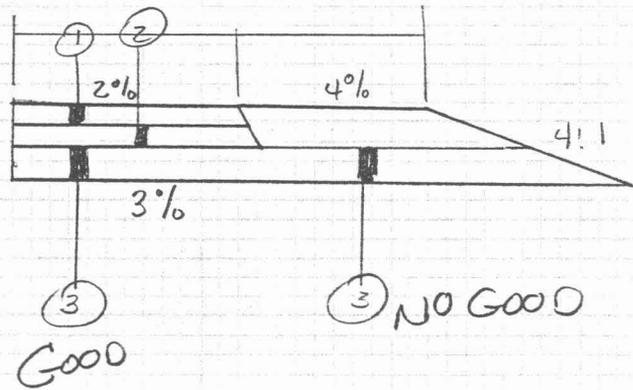
12. EXISTING UNDERGROUND UTILITY LINES ARE SHOWN ON THE DRAWINGS BASED UPON THE BEST INFORMATION AVAILABLE TO THE ENGINEER. THE ENGINEER CAN NOT AND DOES NOT WARRANT THAT THIS INFORMATION IS COMPLETE OR ACCURATE. THE CONTRACTOR MUST COORDINATE DIRECTLY WITH THE INVOLVED UTILITY OWNERS TO HAVE UNDERGROUND UTILITY LINES FIELD LOCATED IN ADVANCE OF CONSTRUCTION.
13. WORK ON STRUCTURES FOR THIS PROJECT REQUIRES EXCAVATION IN THE IMMEDIATE VICINITY OF TRAFFIC AND ADJACENT PROPERTIES. THEREFORE, THE RISK OF A FAILURE OCCURRING DURING THE EXCAVATION REQUIRES THAT EXTREME CAUTION BE EXERCISED. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PLACE WHAT BRACING, SHORING OR GROUND SUPPORT SYSTEM THAT IS DEEMED NECESSARY TO PREVENT A FAILURE AND PROTECT THE PERSONS WORKING NEAR THE EXCAVATION, THE PUBLIC THAT MAY BE ABOVE THE EXCAVATION OR ANY STRUCTURE ADJACENT TO THE EXCAVATION. ALL COSTS FOR ANY PROTECTIVE MEASURES, INCLUDING THE MATERIALS AND LABOR FOR DESIGNING, DRAWING AND CONSTRUCTING THE FACILITY, SHALL BE INCLUDED IN THE PRICE BID FOR CONTRACT ITEMS.
14. THE TOP 3 FEET AND VARIABLE OF THE DESIGN SOILS(BOTH NATURAL AND EMBANKMENT) SHALL BE CONSTRUCTED OF SOIL CLASSIFIED AS A-6(10) OR BETTER, PER AASHTO DESIGNATION: M-145-91, EXCEPT AT UNDERCUT LOCATIONS DESIGNATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER TO RECEIVE CLASS B-15 BORROW EXCAVATION. FOR ADDITIONAL DETAILS THE CONTRACTOR IS REFERRED TO THE NOTICE TO BIDDERS ON DESIGN SOIL MATERIAL IN THE CONTRACT PROPOSAL DOCUMENT.
15. SOME WORK IS REQUIRED OUTSIDE THE PROJECT LIMITS BEYOND THE B.O.P. AND E.O.P. NO ADDITIONAL COMPENSATION WILL BE MADE FOR SUCH WORK EXCEPT AS PROVIDED BY SPECIFIC PAY ITEMS SHOWN ON THE PLANS.
16. *****DISTRICT 5 NOTE ONLY*****
WIRE FENCE WILL BE REQUIRED FOR ALL SILT FENCE (SEE WK. NO. TEC-1)
17. *****DISTRICT 1 & 2 ONLY*****
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FULL COLLARS ARE TO BE USED AT ALL BOX CULVERT EXTENSIONS AND AT ALL BOX CULVERT CONSTRUCTION JOINTS.(SEE ICJ-1 FOR DETAILS)
18. FOR LIST OF PUBLIC UTILITIES, SEE WORKING NO. 3.



EXAGGERATE ASPHALT LIFTS

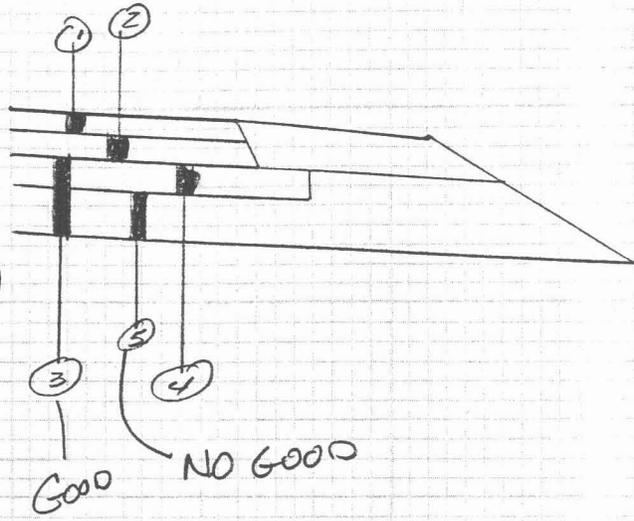


USE BARS NOT ARROWS

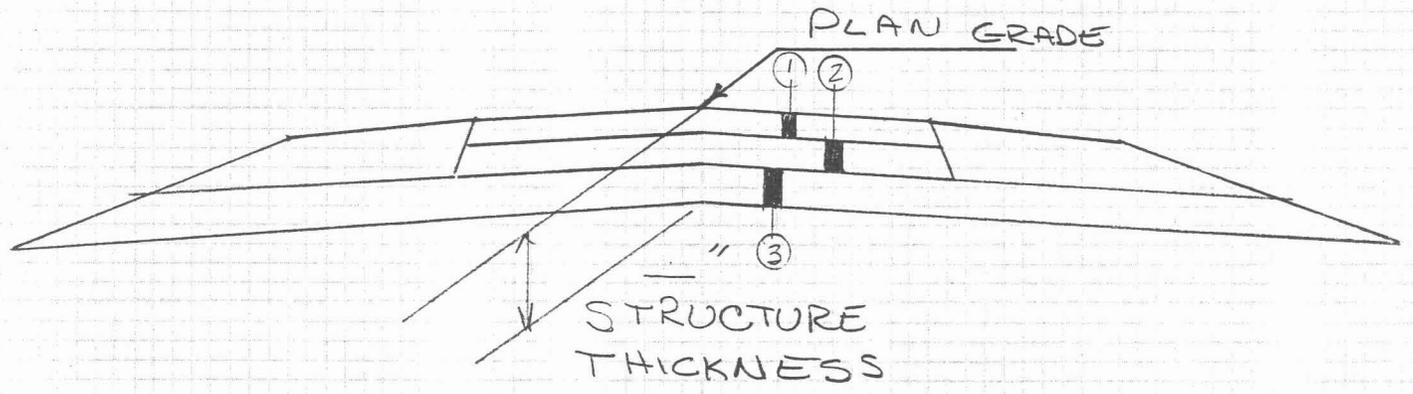


SHOW SUBBASE GR. MAT'L UNDER PAVEMENT

- ① SURFACE & BINDER
- ② BASE
- ③ 12" GR MAT'L (GOOD)
- ④ 6" LIME-FLYASH
- ⑤ 6" GR MAT'L (NO GOOD)

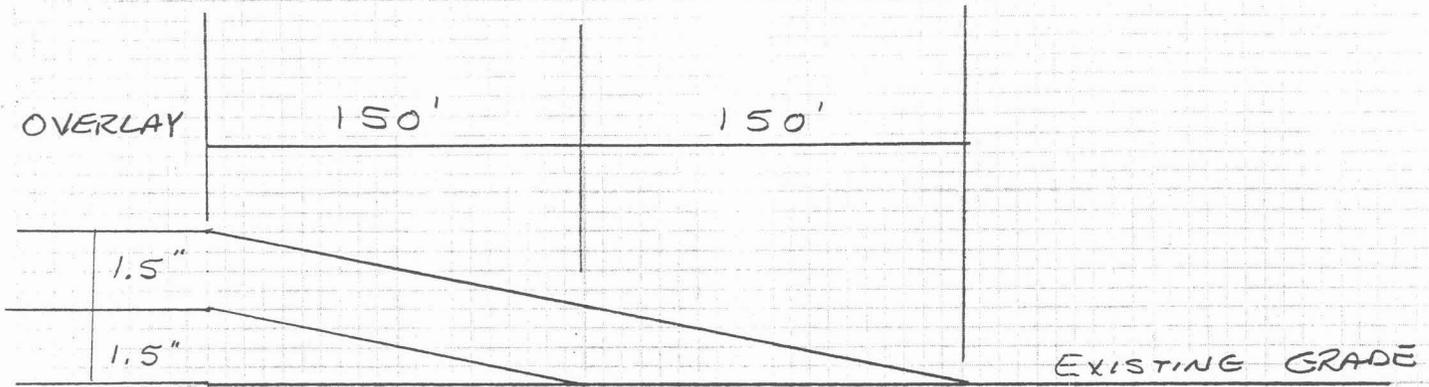


SHOW GR. MAT'L THROUGH LIME-FLYASH



SHOW PLAN GRADE LOCATION
 SHOW STRUCTURE THICKNESS

① + ② + ③ MUST = STRUCTURE THICKNESS



KILL OVERLAY 1" TO 100'

TYPICAL SECTION QUESTIONS

RIGHT LANE WIDTH-----
RIGHT LANE SLOPE-----
LEFT LANE WIDTH-----
LEFT LANE SLOPE-----
RIGHT SHOULDER WIDTH-----
RIGHT SHOULDER SLOPE-----
LEFT SHOULDER WIDTH-----
LEFT SHOULDER SLOPE-----
RIGHT SUBGRADE SLOPE-----
LEFT SUBGRADE SLOPE-----
RIGHT SIDE SLOPE-----
LEFT SIDE SLOPE-----
SURFACE THICKNESS-----
BINDER THICKNESS-----
BLACK BASE THICKNESS-----
PRIME COAT REQUIRED(Y/N)-----
SUBBASE GRANULAR THICKNESS-----
CLASS-----
SHRINKAGE FACTOR-----
LIME/FLYASH THICKNESS-----
EXTRA WIDTH FOR LIME/FLYASH-----
% LIME-----
LIME TREATMENT THICKNESS-----
% LIME-----
SIDESLOPE TO SIDESLOPE(Y/N)-----
CORRECT SUBGRADE SLOPE(Y/N)-----
DISTANCE CROWN MOVED (-LT/+RT)-----
SLOPE CROWN IS MOVED ON-----
SEPARATE SHOULDER MATERIAL(Y/N)-----
SHOULDER GRANULAR THICKNESS-----
SLOPE UNDER RIGHT SHOULDER-----
SLOPE UNDER LEFT SHOULDER-----
CLASS OF GRAN. MATERIAL-----
SHRINKAGE FACTOR-----

BOX CULVERT

PROJECT NO.:
 STATION :
 SIZE:

COUNTY:
 SKEW:
 WING SLOPE:

STD DRAWINGS USED: _____

SKEW FACTOR = _____

PER LINEAR FT BBL _____ CY (CONC) _____ LBS (REIN)

1 J SLAB _____ CY (CONC) _____ LBS (REIN)

| | QUANT. | CONC. | REIN. |
|--|--------|-----------|------------|
| 150' BOX W/ HOWLS & 2-J & 2-W | | | |
| 150' BBL (150 X PER LIN FT BBL) | - | | |
| 2 - J SLABS | - | | |
| ① 2 - NORMAL HOWLS & W SLABS | = | | |
| ① 2 - SKEWED HOWLS & W SLABS | = | | |
| ② (IF ONLY 1 DIVIDE LINE 1 BY 2) | | | |
| ③ (IF SKEWED, MULTIPLY LINE 1 OR 2 BY SKEW FAC.) | | | |
| TOTAL FROM LINE 1, 2, or 3 | | | |
| _____ FT. X PER LIN FT OF BBL | + | | |
| _____ J SLABS (IF REQ'D) | + | | |
| ICX-1 | + | | |
| ICJ-1 | + | | |
| ICJS-1 | + | | |
| TOTAL | | CY | LBS |

STRUCTURAL EXCAVATION

$$\text{STR. EXC.} = (\text{LENGTH} \times \text{FACTOR} \times \text{AVG. DEPTH}) + (1 \times \text{HOWL FACTOR} \times \text{AVG. DEPTH}) + (1 \times \text{TOEWALL FACTOR})$$

$$= (\text{_____} \times \text{_____} \times \text{_____}) + (1 \times \text{_____} \times \text{_____}) + (1 \times \text{_____})$$

$$= \text{_____} \text{ CY.}$$

TO CALCULATE SELECT MATERIAL USE 0.5 AS AVERAGE DEPTH AND LEAVE OUT TOEWALL QUANTITY.

* MULTIPLY BY 2 IF THERE ARE MORE THAN ONE

| PIPE SIZE | TOE WALL CY | PIPE COLLAR CY | PIPE DEDUCT CY | PIPE THICKNESS IN | GRAN. CLASS | MTRL. #/CF | CONVERSIONS T/CY |
|-----------|-------------|----------------|----------------|-------------------|-------------|------------|------------------|
| 15 | 0.056 | 0.280 | 0.038 | 2.25 | 1-2 | 131 | 1.7685 |
| 18 | 0.063 | 0.320 | 0.053 | 2.50 | 3-4 | 129 | 1.7415 |
| 24 | 0.083 | 0.410 | 0.091 | 3.00 | 5-6 | 127 | 1.7145 |
| 30 | 0.102 | 0.510 | 0.138 | 3.50 | OTHER | 114 | 1.539 |
| 36 | 0.123 | 0.620 | 0.196 | 4.00 | SOIL | 100 | |
| 42 | 0.134 | 0.730 | 0.263 | 4.50 | CR. STONE | 160 | |
| 48 | 0.145 | 0.850 | 0.340 | 5.00 | DBST | | |
| 54 | 0.156 | 0.980 | 0.427 | 5.50 | SEAL | .28 CF/SY | |
| 60 | 0.167 | 1.110 | 0.524 | 6.00 | COARSE | .52 CF/SY | |
| 66 | 0.177 | 1.248 | 0.630 | 6.50 | ASP. CEM. | .75 G/SY | |
| 72 | 0.188 | 1.393 | 0.747 | 7.00 | | | |
| 18 X 11 | 0.056 | 0.280 | 0.038 | 2.25 | | | |
| 2 X 13 | 0.063 | 0.310 | 0.053 | 2.50 | | | |
| 29 X 19 | 0.083 | 0.410 | 0.087 | 3.00 | | | |
| 36 X 23 | 0.102 | 0.490 | 0.129 | 3.50 | | | |
| 44 X 27 | 0.123 | 0.600 | 0.185 | 4.00 | | | |
| 51 X 31 | 0.134 | 0.690 | 0.245 | 4.50 | | | |
| 58 X 36 | 0.145 | 0.820 | 0.318 | 5.00 | | | |
| 65 X 40 | 0.156 | 0.920 | 0.394 | 5.50 | | | |
| 73 X 45 | 0.167 | 1.070 | 0.489 | 6.00 | | | |
| 88 X 54 | 0.207 | 1.366 | 0.688 | 7.00 | | | |

GRAN. CLASS #/CF T/CY
 1-2 131 1.7685
 3-4 129 1.7415
 5-6 127 1.7145
 OTHER 114 1.539
 SOIL 100
 CR. STONE 160
 DBST
 SEAL .28 CF/SY
 COARSE .52 CF/SY
 ASP. CEM. .75 G/SY
 SBST
 SEAL .28 CF/SY
 ASP. CEM. .38 G/SY
 LIME-FLYASH 2' OUTSIDE P.E.
 LEGENDS
 ONLY" 22.0 SF
 TURN ARROW 16.4 SF
 REBAR
 1/2 IN. #4 0.668 #/FT
 5/8 IN. #5 1.043 #/FT
 3/4 IN. #6 1.502 #/FT
 7/8 IN. #7 2.044 #/FT
 1.0 IN. #8 2.670 #/FT
 RIP-RAP
 150 #/SF @ 15" DEPTH
 180 #/SF @ 18" DEPTH
 120 #/CF
 NEAREST 20 TONS
 EROSION CONTROL ON GRAN.
 MATERIAL GREATER THAN
 CLASS 5 ONLY
 X-OVER
 88' BULLETNONE 1250 SY
 125' X-OVER 1080 SY
 150' X-OVER 1192 SY

APRON QUANTITIES:

INLET APRON
 MI-4 1.203 CY
 MI-4A 0.819 CY
 OTHERS 0.532 CY

SOLID SOD QUANTITIES:

4 SF/LF PAVED DITCH
 8.30 SY PER EACH MI-1, MI-2 OR MI-3 INLET
 9.78 SY PER EACH MI-4A INLET
 11.33 SY PER EACH MI-4 INLET

STRUCTURE ANALYSIS

RFACE .44 CUT RT ASPHALT 1.98 TONS/CY
 CINDER .44 FILL LT PRIME 0.35 G/SY
 BASE .34
 CL9GPD .09

BENCHING:

35' IN CUT
 45' IN FILL