## INDEX TO DETAILS

<table>
<thead>
<tr>
<th>NO.</th>
<th>CATEGORY</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>MISC.</td>
<td>GENERAL NOTES</td>
<td>RESIDENTIAL STREETS HOT MIX ASPHALT CONCRETE PAVEMENT</td>
</tr>
<tr>
<td></td>
<td>GENERAL NOTES (WATAUGA PROJECT SIGN)</td>
<td>RESIDENTIAL STREETS HOT MIX ASPHALT CONCRETE PAVEMENT</td>
</tr>
<tr>
<td></td>
<td>TRENCH EMBEDMENT AND BACKFILL DETAILS</td>
<td>RESIDENTIAL STREETS HOT MIX ASPHALT CONCRETE PAVEMENT</td>
</tr>
<tr>
<td>PAVING</td>
<td>RESIDENTIAL STREETS REINFORCED CONCRETE PAVEMENT</td>
<td>COLLECTOR STREETS HOT MIX ASPHALT CONCRETE PAVEMENT</td>
</tr>
<tr>
<td></td>
<td>COLLECTOR STREETS REINFORCED CONCRETE PAVEMENT</td>
<td>ARTERIAL &amp; INDUSTRIAL STREETS HOT MIX ASPHALT CONCRETE PAVEMENT</td>
</tr>
<tr>
<td></td>
<td>ARTERIAL &amp; INDUSTRIAL STREETS REINFORCED CONCRETE PAVEMENT</td>
<td>CHIP SEAL PAVEMENT SECTION DETAIL</td>
</tr>
<tr>
<td></td>
<td>TYPICAL LEFT TURN LAINES</td>
<td>PAVEMENT MARKING DETAILS</td>
</tr>
<tr>
<td></td>
<td>CONCRETE VALLEY DETAILS</td>
<td>CURB RAMP DETAILS</td>
</tr>
<tr>
<td></td>
<td>RESIDENTIAL DRIVE DETAILS</td>
<td>COMMERCIAL DRIVE DETAILS</td>
</tr>
<tr>
<td></td>
<td>DRIVE WITH CULVERT DETAILS</td>
<td>COMBINATION RAIL TYPE C301</td>
</tr>
<tr>
<td></td>
<td>COMBINATION RAIL TYPE C301</td>
<td>COMBINATION RAIL TYPE C301</td>
</tr>
<tr>
<td></td>
<td>CONCRETE CURB &amp; GUTTER</td>
<td>DRAINAGE</td>
</tr>
<tr>
<td></td>
<td>TYPICAL CHANNEL LINERS</td>
<td>STORM DRAIN FLOOD LIMITS</td>
</tr>
<tr>
<td></td>
<td>REINFORCED CONCRETE CHANNEL LINER DETAILS</td>
<td>REINFORCED CONCRETE CHANNEL LINER DETAILS</td>
</tr>
<tr>
<td></td>
<td>CONCRETE PILOT CHANNEL</td>
<td>CHANNEL ACCESS RAMP, SHT. 1 OF 2</td>
</tr>
<tr>
<td></td>
<td>CHANNEL ACCESS RAMP, SHT. 2 OF 2</td>
<td>CONCRETE CHANNEL APRON FOR S.D. WITH VERTICAL HEADWALL</td>
</tr>
<tr>
<td></td>
<td>CONCRETE CHANNEL APRON FOR S.D. WITH SLOPING HEADWALL</td>
<td>CONCRETE COLLAR DETAILS</td>
</tr>
<tr>
<td></td>
<td>CONCRETE DRAIN TAP DETAILS</td>
<td>CONCRETE PLUG DETAILS</td>
</tr>
<tr>
<td></td>
<td>CONCRETE PLUG DETAILS</td>
<td>STANDARD DROP DETAILS</td>
</tr>
<tr>
<td></td>
<td>STANDARD DROP DETAILS</td>
<td>STD. 4' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 1 OF 2</td>
</tr>
<tr>
<td></td>
<td>STD. 4' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 2 OF 2</td>
<td>STD. 5' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 1 OF 2</td>
</tr>
<tr>
<td></td>
<td>STD. 5' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 2 OF 2</td>
<td>STD. 6' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 1 OF 2</td>
</tr>
<tr>
<td></td>
<td>STD. 6' SQ. STORM DRAIN MANHOLE/VAULT, SHT. 2 OF 2</td>
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</tr>
<tr>
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<td>STANDARD CURB INLET, DETAIL NO. 1</td>
</tr>
<tr>
<td></td>
<td>STANDARD CURB INLET, DETAIL NO. 2</td>
<td>STANDARD CURB INLET, DETAIL NO. 3</td>
</tr>
<tr>
<td></td>
<td>STANDARD CURB INLET, DETAIL NO. 3</td>
<td>INLET PROTECTION BLOCK AND GRAVEL</td>
</tr>
<tr>
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<td>RECESSED CURB INLET</td>
</tr>
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<td>RECESSED CURB INLET</td>
<td>WATER</td>
</tr>
<tr>
<td></td>
<td>VALVE AND THRUST BLOCK DETAILS</td>
<td>DETAIL OF VALVE LOCATIONS AT STREET INTERSECTIONS</td>
</tr>
<tr>
<td></td>
<td>DETAIL OF VALVE LOCATIONS AT STREET INTERSECTIONS</td>
<td>FIRE HYDRANT DETAILS</td>
</tr>
<tr>
<td></td>
<td>FIRE HYDRANT DETAILS</td>
<td>FIRE HYDRANT AND WATER METERS</td>
</tr>
<tr>
<td></td>
<td>FIRE HYDRANT AND WATER METERS</td>
<td>WATER SERVICE CONNECTION DETAILS SINGLE AND DOUBLE</td>
</tr>
<tr>
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<td>2&quot; WATER SERVICE</td>
</tr>
<tr>
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<td>2&quot; WATER SERVICE</td>
<td>DOMESTIC 4&quot; METER INSTALLATION</td>
</tr>
<tr>
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<td>IRRIGATION 4&quot; METER INSTALLATION</td>
</tr>
<tr>
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<td>IRRIGATION 4&quot; METER INSTALLATION</td>
<td>DETECTOR CHECK INSTALLATION DETAILS</td>
</tr>
<tr>
<td></td>
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<td>PIPE RESTRAINT DETAIL</td>
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<td>TRACE LINE TEST POINT DETAILS</td>
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<td>TRACE LINE TEST POINT DETAILS</td>
<td>BY-PASS DETAIL</td>
</tr>
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</tr>
<tr>
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<td>PRECAST CONCRETE MANHOLE DETAILS</td>
</tr>
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</tr>
<tr>
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<td>SEWER SERVICE CONNECTION DETAILS</td>
</tr>
<tr>
<td></td>
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<td>MANHOLE VENT DETAIL</td>
</tr>
<tr>
<td></td>
<td>MANHOLE VENT DETAIL</td>
<td>MANHOLE DROP</td>
</tr>
<tr>
<td></td>
<td>MANHOLE DROP</td>
<td>TRACE LINE TEST POINT DETAILS</td>
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<td>TRACE LINE TEST POINT DETAILS</td>
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1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATAUGA STANDARDS AND SPECIFICATIONS.
2. UTILITY CONTRACTOR AND STREET CONTRACTOR ARE TO NOTIFY A CITY TECHNICAL CONSTRUCTION INSPECTOR, AT (817) 514–5838, AT LEAST 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. ALL SANITARY SEWER PIPE SHALL BE SDR 35 PVC (ASTM D–3034).
4. ALL STORM DRAINAGE PIPE SHALL BE ASTM C–76, CLASS III REINFORCED CONCRETE, UNLESS NOTED OTHERWISE.
5. ALL WATER MAINS SHALL BE PVC AWWA–C900, DR18, CLASS 150 (FACTORY INSTALLATION GASKETS).
6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COST OF A MAXIMUM NUMBER OF PASSING FIELD DENSITY TESTS ON LIME STABILIZED SUBGRADE EQUAL TO THE RATIO OF 1 PER 100 LINEAR FEET OF STREET AND ALL FAILING DENSITY TESTS AND REQUIRED MOISTURE–DENSITY CURVES.
7. ALL FILL SHALL BE COMPACTED TO 95% (+ or – 2% O.M.) OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR METHOD (ASTM D–698).
8. ROUTE WATER LINES AROUND STORM DRAIN INLETS WITH A MINIMUM OF 12” CLEARANCE OUT-TO-OUT.
9. "CURB RAMPS" ARE TO BE CONSTRUCTED ON ALL PERMANENT CURB RETURNS AT INTERSECTIONS OF ALL STREETS OR AS DIRECTED BY THE PUBLIC WORKS DEPARTMENT.
10. ALL CONSTRUCTION BARRICADE TO BE IN ACCORDANCE WITH CURRENT "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" GUIDELINES.
11. GATE VALVES SHALL CONFORM TO ANSI/AWWA C509–87 R.S. VALVE.
12. MATERIAL DISPOSAL FOR CITY PROJECTS— THE CONTRACTOR SHALL NOTIFY THE PUBLIC WORKS DIRECTOR IN WRITING OF PROPOSED MATERIAL DISPOSAL SITES TO BE UTILIZED WITHIN THE CITY OF WATAUGA. THE NOTIFICATION SHALL INCLUDE THE LEGAL LOT/BLOCK, ADDITION DESCRIPTION AND ADDRESS OF THE PROPOSED SITE. THE PUBLIC WORKS DIRECTOR SHALL BE NOTIFIED TWO (2) WEEKS IN ADVANCE OF ANY MATERIAL BEING DEPOSITED.
14. EBAA IRON "MEGALUG" SERIES REASTRAINTS SHALL BE USED AT ALL MECHANICAL JOINT FITTINGS AND ON PIPE JOINTS WHERE INSUFFICIENT LENGTH OF STRAIGHT PIPE IS SUPPORTED IN TRENCH.
3.2.26 PROJECT SIGN: SUBSIDIARY TO BID ITEMS.
THE CONTRACTOR SHALL FURNISH AND MAINTAIN
ALL-WEATHER PROJECT SIGN AS ILLUSTRATED BELOW. THE
SIGN SHALL HAVE A BLUE BACKGROUND WITH WHITE FRAME
AND LETTERING. IT SHALL BE LOCATED AT THE PROJECT
SITE AS DIRECTED BY THE OWNER’S PROJECT REPRESENTATIVE.

WATAUGA
BOND FINANCED
PROJECT—$_______
FOR CONSTRUCTION OF

_____________________________________

PROJECTED COMPLETION—___, 200___

2’-0” 4’-0” 2’-0”

4”x4”x10’
S4S TREATED

- 3-8”

1.5”

SECTION A—A

* GENERAL NOTES *

WATAUGA
TEXAS

3.2.26 1-1-98 FIGURE 2M
MISCELLANEOUS TRENCH EMBEDMENT AND BACKFILL DETAILS

WATER

- Native Trench Material (no rocks over 3" in dia.)
- Tracer Wire—Blue 6" above sand
- Cushion Sand
- Normally AWWA C-900 DR-18 Class 150 PVC

STORM DRAIN

- Native Trench Material (no rocks over 3" in dia.)
- No rocks larger than 1" dia.
- Washed rock to Spring Line
- 3" of washed rock below pipe as bedding

SANITARY SEWER

- Green Tracer Wire 6" above backfill (chat).
- Cushion Sand Fill
- Chat or #4 Chico not to exceed 1-1/2 to Spring Line
- Normally SDR 35 PVC

GENERAL NOTES:
1. All trench backfill shall be compacted to 95% standard proctor dry density (ASTM D-698).
2. Mechanically compacted trench backfill shall be placed in no greater than 6" lifts. Testing shall be at the rate of one test per lift per 300 feet of trench.

TRENCH EMBEDMENT & BACKFILL DETAILS

WATAUGA
TEXAS

1-1-98
R/2-18-02
FIGURE 3M
FOUNDATION COURSE --

CEMENT OR LIME TREATED SUBGRADE (6") -- IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20, THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED. IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL.

NOTE: MINIMUM OF 33 LBS/S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.

NOTE: PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15–0.20 GALLONS PER SQUARE YARD. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05–0.10 GALLONS PER SQUARE YARD.
RIGHT-OF-WAY VARIES (50' USUAL)

10'-0" PARKWAY (USUAL) 30'-0" ROADWAY

MONOLITHIC CONSTRUCTION

COMPACTED BACKFILL

EXCAVATION LIMITS

3/16"x1-1/2" DEEP SAWED JT. FILLED W/ELASTOMERIC MATL. WHEN NO CONST. JT. USED HERE

6" REINF. CONCRETE

6" STABILIZED SUBGRADE

COLD JT.

LIMITS OF PAY FOR STABILIZED SUBGRADE

TRANSVERSE JOINT

SAWED OR GROOVED TRANSVERSE JT. W/ELASTOMERIC FILLER

EXP. JTS. @ INTERSECTIONS BUT NOT TO EXCEED 250' C/C

LONGITUDINAL JOINT

STEE LAYOUT PLAN

#3 BARS @ 18" E.W.

#3 BARS @ 18" C/C

BACK OF CURB

LONGITUDINAL CONST. JT. DETAIL

#3 BARS @ 18" C/C

3/8" WIDE x 1" FORMED GROOVE W/ELASTOMERIC FILLER OR EQUAL

#4 x 30" DEFORMED BARS ON 18" C/C

LONGITUDINAL JOINT

CURB REINFORCING

SEAL WITH TxDot APPROVED HOT Poured ELASTOMERIC MATERIAL

3/4"x15" SMOOTH DOWELS ON 12" C/C

1 1/2"

EXPANSION JT. DETAIL

3/4" PREMOLDED EXP. JT. MAT'L

THIS HALF OF DOWEL TO BE COATED W/ASPHALT TO PROVIDE SLIPPAGE

TOOLED EDGES

EXPANSION CAP

7.5" 4.5" 3" 2" 1"

3/4"x15"

EXP. JT. MAT'L

CURB POURER SEPARATELY, NOT SAME DAY.

CROWN shall BE 6"

NOTES:
1. MINIMUM OF 33lbs./S.Y. LIME is REQUIRED FOR SUBGRADE STABILIZATION.
2. STRAIGHT CROWN (GABLE vs. PARABOLIC) MAY BE USED FOR CONCRETE STREETS. HEIGHT OF CROWN SHALL BE 6"
3. STEEL CHAIRS APPROVED BY THE OWNER'S REPRESENTATIVE TO SUPPORT REINFORCING STEEL shall BE PLACED AT THE INTERSECTION OF LONGITUDINAL AND TRANSVERSE BARS.
4. PROVIDE CONTINUOUS WELDED DOWEL BAR CHAIR CONSISTING OF 2 NO. 6 GAGE WIRE CHAIR AND DOWEL HOLDER AT EACH DOWEL AND 2-3/8" DIA. STEEL BARS WELDED AT EACH INTERSECTION. ALL DOWEL BARS ACROSS JOINTS SHALL HAVE ONE END FULLY COATED WITH ASPHALT (AS AC-10) TO PREVENT BOND WITH CONCRETE OR APPROVED EQUAL. DOWEL BARS shall BE PROVIDED WITH EXP. CAPS.
GENERAL NOTES:

1. COAT WITH ASPHALT THE SIDES OF GUTTERS WHICH ARE IN CONTACT WITH HMAC PAVEMENT.
2. FOUNDATION COURSE—CEMENT OR LIME TREATED SUBGRADE (10%) IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20, THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED, IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AND ALTERNATE STABILIZING AGENT MAY BE USED IF APPROVED BY THE ENGINEER.
3. MINIMUM OF 50 LBS/S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.
4. PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15–0.20 GALLONS PER S.Y. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05–0.10 GALLONS PER S.Y.
NOTES:
1. COAT WITH ASPHALT THE SIDES OF GUTTERS WHICH ARE IN CONTACT WITH HMAC PAVEMENT.
2. FOUNDATION COURSE—CEMENT OR LIME TREATED SUBGRADE (8")—IF THE NATURAL SUBGRADE HAS A P.I. LESS THAN 20, THE ENGINEER MAY SPECIFY CEMENT OR LIME TREATED SUBGRADE AFTER CONSIDERING LINEAR SHRINKAGE, SOIL CLASSIFICATION, SEEPAGE, AND OTHER FACTORS. IF THE NATURAL SUBGRADE HAS A P.I. GREATER THAN 20, LIME TREATED SUBGRADE SHALL BE USED. IF SUFFICIENT DEPTH OF SUITABLE SUBGRADE MATERIAL IS NOT AVAILABLE, IT SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL. AN ALTERNATE STABILIZING AGENT MAY BE USED IF APPROVED BY THE ENGINEER.
3. MINIMUM OF 50 LBS./S.Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.
4. PRIME COAT SHALL BE APPLIED AT THE RATE OF 0.15–0.20 GALLONS PER S.Y. TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05–0.10 GALLONS PER S.Y.
**GENERAL NOTES:**

1. **STEEL CHAIRS** APPROVED BY THE OWNER'S PROJECT REPRESENTATIVE TO SUPPORT REINF. STEEL SHALL BE PLACED AT THE INTERSECTION OF LONGITUDINAL AND TRANSVERSE BARS AT SPACINGS OF 3'-0" LONGITUAND AND 3'-4" TRANSVERSELY.

2. PROVIDE CONTINUOUS WELDED DOWEL BAR CHAIR CONSISTING OF 2 NO. 8 gage wire chair and dowel holder at each dowel. 2-3/8" x .034" STEEL BARS WELDED AT EACH INTERSECTION. ALL DOWEL BARS SHALL HAVE ONE END FULLY COATED WITH ASPHALT (AS AC-10) TO PREVENT BOND WITH CONCRETE. DOWEL BARS SHALL BE PROVIDED WITH EXPANSION CAPS.

3. PAVEMENT LAYOUT WILL NECESSITATE THAT LONGITUDINAL JOINTS CONFORM WITH LANE LINES—THRU LANE CONST. WILL BE CONTINUOUS WITH ALL LEFT TURN LANE & TRANSECTION TO BE Poured AS FULL-INS SUBJECT TO THE OWNER'S PROJECT REPRESENTATIVE.

4. MINIMUM OF 40 LBS./Y. LIME WILL BE REQUIRED FOR SUBGRADE STABILIZATION.

5. HEIGHT OF CROWN SHALL BE 8".

---

**SECTION 3T ARTERIAL & INDUSTRIAL STREETS**

**SECTION 4T**

**LONGITUDINAL SECTION**

- **EXP. JT. TYPE E**
- **CONTRACTION JT. TYPE W**
- **CONTRACTION JT. TYPE C**

**REINF. CONC. PAVEMENT**

**TRANSVERSE CONTRACTION JT. TYPE W**

**FILLED WITH JT. SEALER**

**4" CONC. MEDIAN PAV. WHEN ORDERED**

**6'-0"**

**1/2" EXP. RECESSED 1" &**

**VARIABLE 10" TO 12" LANE W/OUT MEDIAN, USE TYPE C JOINT ON CL**

**VARIABLE 10" TO 12" LANE W/OUT MEDIAN, USE TYPE C JOINT ON CL**

**EXP. JTS. @ INTERSECTION NOT TO EXCEED 250'-0" C-C**

---

**SECTION 3T**

**SECTION 4T**

**ARTERIAL & INDUSTRIAL STREETS**

**REINFORCED CONCRETE PAVEMENT**

**WATAUGA**

**FIGURE 6P 1-1-98**
TYPICAL STREET SECTION

NOT TO SCALE

NOTE:
SINGLE COURSE CHIP SEAL (ITEM 321, *TxDot SPECS.)
- ASPHALT (AC-5 PER ITEM 300, TxDot SPECS.);
   RESIDUAL ASPHALT RATE=0.25 GAL./S.Y.
- AGGREGATE (PB-GRADE 5 PER ITEM 304, TxDot SPECS.);
  APPLICATION RATE=1 C.Y. PER 135 S.Y.

*TxDot=TEXAS DEPARTMENT OF HIGHWAYS & PUBLIC TRANSPORTATION
TYPICAL DASH LINE 10 FT. DASH WITH 6 BUTTONS ON 2 FT. CENTERS 30 FT. SPACES

NOTE: LEAD BUTTONS TO BE REFLECTIVE TYPE IC OR TYPE IA.  
ALL OTHER BUTTONS TYPE "W" OR "Y", AS SPECIFIED ON PLANS.

TYPICAL DOUBLE YELLOW (NO PASSING)

NOTE: BUTTONS TO BE INSTALLED ON 4 FT. CENTERS, 8 INCHES APART.  
LINE TO TERMINATE FOR INTERSECTIONS.  BUTTONS TO BE TYPE "Y" WITH TYPE IIAA 
BUTTONS ON 20 FT. CENTERS.  TYPE IIAA BUTTONS TO BE USED AT THE START AND 
END OF STRIPES AT INTERSECTIONS.

TYPICAL CONTINUOUS LEFT TURN LANE

NOTE: ALL BUTTONS TO BE TYPE "Y" AND TYPE IIAA.  OUTSIDE LINE TO BE ON 
4 FT. CENTERS AS ABOVE.  INSIDE DASH TO BE ON 4 FT. CENTERS AS ABOVE.  
TYPE IIAA BUTTONS AT START OF EACH DASH TO MATCH TYPE IIAA BUTTONS 
in the line.  Lines and dashes to terminate at intersections with type 
IIAA BUTTONS.

SPECIAL PROVISIONS:
1. BUTTONS AS PER ITEM 676 TDHPT STD. SPECS. 1982.
3. CONSTRUCTION – AS PER ITEM 676.4 TDHPT STD. SPECS. 1982.
4. ALL CONCRETE STREETS TO BE SAND BLASTED BEFORE BUTTON APPLICATION.
5. DESIGN TO BE APPROVED BY CITY OF WATAUGA.
6. COLOR OF BUTTONS TO BE FURNISHED AND INSTALLED IN ACCORDANCE 
WITH THE APPLICABLE PROVISIONS OF THE TEXAS MANUAL ON 
UNIFORM TRAFFIC CONTROL DEVICES.
7. SIZE OF ALL BUTTONS TO BE FOUR (4") INCHES IN DIAMETER UNLESS 
OTHERWISE SPECIFIED.
STREET WITH CURBED MEDIAN

NOTE: ALL BUTTONS TO BE TYPE IC.

STREET WITH TERMINATING CONTINUOUS
LEFT TURN LANE AT SIGNALIZED INTERSECTION:

WHITE LONGITUDINAL LINE

1. A STORAGE LANE SHALL BE DESIGNED TO ACCOMMODATE THE APPROPRIATE AMOUNT OF TRAFFIC.

2. THE WHITE LONGITUDINAL LINE SHALL BE OF TYPE IC. (SEE LAYOUT DETAIL ABOVE.)

3. TYPE 'Y' JIGGLE BARS SHALL BE 6" SQUARE.
NOTE: PAYMENT FOR CONCRETE VALLEY WILL BE BY THE SQ. FT. INTEGRAL CURB & GUTTER WILL BE PAID FOR BY L.F. OF CURB & GUTTER OF SIZE AS SHOWN.

PLAN
NOT TO SCALE

REINF. #3 BARS @ 18"
O.C.E.W. INCLUDED IN BID PRICE PER SQ. FT.
OF CONC. VALLEY

1 1/2" OR AS DIRECTED BY THE OWNER'S PROJECT REPRESENTATIVE.

SECTION
NOT TO SCALE

LOWER PART OF PAVEMENT UNDER VALLEY WHEN PAVEMENT THICKNESS EXCEEDS 6". PAYMENT INCLUDED IN BID PRICE OF CONC. VALLEY.

NOTE: CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT/C.Y., MAXIMUM SLUMP OF 5 INCHES, AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.

<table>
<thead>
<tr>
<th>CROWN TRANSITION FOR CONCRETE VALLEY</th>
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<td>DISTANCE FROM % OF VALLEY 6&quot; 7&quot; 8&quot;</td>
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<tr>
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</tr>
<tr>
<td>0'       0.000'  0.000'  0.000'</td>
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<tr>
<td>5'       0.167'  0.167'  0.167'</td>
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<tr>
<td>10'      0.290'  0.290'  0.290'</td>
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<td>20'      0.445'  0.445'  0.465'</td>
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<td>30'      0.500'  0.540'  0.580'</td>
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<tr>
<td>40'      0.500'  0.583'  0.635'</td>
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<tr>
<td>50'      0.500'  0.583'  0.667'</td>
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NOTE: IF GUTTER IS CRACKED, DRIVEWAY & GUTTER MUST BE POURED MONOLITHICALLY.

PLAN

SAWCUT GUTTER AND CURB FULL DEPTH

SECTION

SAWCUT & FORM 3/4" RISE AT EDGE OF EXIST. GUTTER. TOOL EDGE & BRUSH JT. WHILE CONC. IS FRESH.

*DESIGN GRADE FOR A MAX. OF 18% BREAKOVER BETWEEN GRADES 15' APART.

NOTES:
1. MINIMUM THICKNESS OF DRIVEWAY IS 5", USE 3000 PSI COMPRESSIVE STRENGTH CONCRETE WITH 5" MAXIMUM SLUMP.
2. CONCRETE TO BE POURED WITHIN 72 HOURS FROM THE TIME THE CURB & GUTTER IS SAWCUT.
3. PARKWAY, SIDEWALK, AND DRIVEWAY SIDEWALK SECTION WILL ALL HAVE A 1/4" PER FOOT SLOPE DOWN IN THE DIRECTION OF THE TOP OF CURB.
4. SEE FIGURE 4P FOR EXPANSION JOINT DETAIL.

DETAIL

STANDARD SIDEWALK

RESIDENTIAL DRIVE DETAILS

WATAUGA
TEXAS

1-1-98

FIGURE 12P
NOTE: IF GUTTER IS CRACKED, DRIVEWAY AND GUTTER MUST BE Poured MONOLITHICALLY.

NOTES:
1. MINIMUM THICKNESS OF DRIVEWAY IS 6", USE 3000 PSI COMPRESSIVE STRENGTH CONCRETE WITH 5" MAXIMUM SLUMP.
2. CONCRETE TO BE Poured WITHIN 72 HOURS FROM THE TIME THE CURB & GUTTER IS SAWCUT.
3. PARKWAY, SIDEWALK, AND DRIVEWAY SIDEWALK SECTION WILL ALL HAVE A 1/4" PER FOOT SLOPE DOWN IN THE DIRECTION OF THE TOP OF CURB.
4. SEE FIGURE 4P FOR EXPANSION JOINT DETAIL.
CURB ON DRIVE APPROACH IS OPTIONAL

CROSS HATCHED AREA REPRESENTS DRIVE APPROACH PAVEMENT. PAVEMENT TO BE EITHER 5 INCHES OF REINFORCED CONCRETE OR 6 INCHES OF HOT MIX ASPHALTIC CONCRETE (HMAC).

EXISTING DITCH

THIS SLOPED AREA SHOULD BE SODDED TO RESIST EROSION (BOTH ENDS).

DRIVE APPROACH WIDTH

MIN. CROSS SLOPE ON DRIVER 1/8" PER FT.

EDGE TO BE STRAIGHT

EDGE OF ASPHALT

CULVERT PIPE TO BE 18 INCH DIAMETER OR LARGER. ENDS TO BE CUT ON 6:1 SLOPE. PIPE TO BE EITHER CORRUGATED, GALVANIZED METAL PIPE OR REINFORCED CONCRETE TONGUE AND GROOVE PIPE.

PROPOSED DRIVE APPROACH

6:1 SLOPE

6:1 SLOPE

DOWNSTREAM

SLOPE

UPSTREAM

NEW CULVERT PIPE

NOTE: UPSTREAM AND DOWNSTREAM GRADING IN ROADWAY DITCH IS PROPERTY OWNER'S RESPONSIBILITY DURING DRIVE APPROACH INSTALLATION.

ELEVATION

PROPERTY LINE

PROPOSED DRIVE APPROACH PAVEMENT SURFACE

EXISTING DRIVE

BACKFILL IN DITCH TO BE COMPACTED

CULVERT PIPE (18" DIAMETER OR LARGER)

1/4" PER FT.

EDGE WHERE DRIVE APPROACH MEETS PAVEMENT TO BE STRAIGHT.

DRIVE WITH CULVERT DETAILS

WATUGA TEXAS

1-1-98

FIGURE 14P

NOTES:
1. ALL CULVERT PIPE TO BE NEW (NOT PREVIOUSLY USED).
2. DIAMETER OF CULVERT PIPE TO BE DETERMINED BY THE PUBLIC WORKS DEPARTMENT.
3. FUTURE MAINTENANCE OF THE DRIVE APPROACH AND CULVERT PIPE IS THE PROPERTY OWNER'S RESPONSIBILITY.
4. ALL DITCH GRADING UPSTREAM AND DOWNSTREAM OF THE PROPOSED DRIVEWAY CULVERT IS THE PROPERTY OWNER'S RESPONSIBILITY.
END OF RAIL FOR PAYMENT
9" MIN.
3'-7" MAX.

PERMISSIBLE SHOP SPICE
(ONE PER PANEL)
8'-4" MAX. POST SPACING

PROVIDE TUBE SPLICES FOR RAIL
MEMBERS WITHIN PANEL OVER
(EXPANSION) ARMOR JOINTS
OR FINGER JOINTS.

END OF ABUTMENT
WINGWALL

NOTE: TUBE SPLICES ARE NOT REQUIRED
AT ENDS OF UNIT FOR (FIXED)
ARMOR JOINTS AND JOINTS IN PANTO FORM
SPANS OR SIMPLE SLAB SPANS.

DO NOT PROVIDE A
TUBE SPACE IN THIS
PANEL UNLESS THERE
IS AN ARMOR PLATE
HERE

AT ABUTMENT
BENTS

NOTE: METAL BEAM GUARD FENCE
MUST BE ATTACHED TO THE BRIDGE
RAIL AND EXTENDED ALONG THE
EMBANKMENT. SEE PLAN SHEET
FOR DETAILS AND LENGTH FOR
PAYMENT.

INSIDE ELEVATION OF RAIL

SECTION D-D

METAL BEAM GUARD FENCE TO RAIL CONN.

3/16" R

3/8" DIA. DIAM. HOLES (2 END HOLES
IN TUBES TO BE DRILLED)

2-1/2" x 3/8" x 22-1/4"
BENT AS SHOWN (GALVANIZED)

5/8" SLOTTED TRUSS HD. BOLTS
WITH WASHERS

4-5/8" HD. BOLTS

1/4" RADIUS
DRAIN HOLE

1/2" POST

BEND ZONE

C-2-1/2"

10-3/4"

2-1/2"

3/16" R

3/8" DIA. DIAM. HOLES

FIELD OFFSET 3/8"

2-1/2"

4-1/4"

1/2"

1/2"

1/2"

1-3/4"

2-1/2"

21"R

8-1/2"

6-1/2"

8-1/2"

6-1/2"

4-1/2"

3/16" R

3/8" DIA. DIAM. HOLE IN BOTTOM

RAIL CAP DETAIL

COMBINATION RAIL
TYPE C301

WATAUGA

1-1-98

FIGURE 15P1
NOTE: IN LIEU OF FLANGE WELD SHOWN, A 3/8" FILLET WELD ALL AROUND INCLUDING EDGES OF FLANGE MAY BE USED.

SECTION A-A

SECTION B-B

POST ELEVATIONS

SLEEVE FABRICATION OPTIONS

Note: The difference between the outside dimensions of the sleeve and the inside dimensions of the rail shall not exceed .125" along either axis.

<table>
<thead>
<tr>
<th>Tube and Sleeve Members</th>
<th>THICKNESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Material Thickness</td>
<td>Material</td>
</tr>
<tr>
<td>A500 Gr. C</td>
<td>.188&quot;</td>
</tr>
<tr>
<td>A500 Gr. B</td>
<td>.250&quot;</td>
</tr>
<tr>
<td>A500 Gr. A</td>
<td>.313&quot;</td>
</tr>
<tr>
<td>Gr. A501</td>
<td>.313&quot;</td>
</tr>
<tr>
<td>2-2/7&quot; (Use Member)</td>
<td>.110&quot;</td>
</tr>
</tbody>
</table>

Combination Rail
Type C301

Watauga
Texas

1-1-98
15P2
GENERAL NOTES

*Designed according to AASHTO 1977 Standard and current interim specifications.

*Panel lengths of tube members shall be attached continuously to a minimum of three posts (except at abutments with expansion joints).

*The face of railing shall be vertical if adjacent to a walkway unless otherwise shown in plans. Rail posts shall be perpendicular to adjacent roadway grade. Cutout may be used under base plates if necessary.

*Exposed edges of handrail and handrail posts shall be rounded or chamfered to approximately 1/16" by grinding.

*All bolts, nuts, washers, anchorage plates, bottom plates and M.B.G.F. Connectors are considered parts of the rail for payment.

*All steel components except reinforcing shall be galvanized unless otherwise shown on plans.

*Anchor bolts shall be 3/4" dia. ASTM-A325 (or A321 threaded rods with tack welded nuts). Threaded rods may be 0.670" min. dia. with rolled threads. Each bolt shall have a hardened steel washer and a 2" plain steel washer. Nuts shall conform to A563 requirements and shall be tapped after galvanizing. Bolts and nuts shall have Class A 2B fit tolerances.

*Shop drawings to be submitted to the bridge engineer for approval will be required only for rails on horizontal curves in which case the rail members shall be fabricated to the required radius for radii of 600' or less.

*For rails not requiring shop drawings, erection drawings showing panel lengths, splice locations, rail post spacing and anchor bolt setting shall be submitted to the resident engineer for approval.

*Shop drawings may be submitted as 11"x17" prints provided they are clearly legible.

*All open ends of rail shall be capped.
GUTTER WITH LAID DOWN CURB

STANDARD CURB & GUTTER

DRIVEWAY GUTTER

NEW STANDARD DETAIL
CONCRETE CURB & GUTTER

WATAUGA
TEXAS

FIGURE 16P
FULL 100 YR. CONCRETE CHANNEL LINER

PARTIAL 100 YR. CONCRETE CHANNEL LINER

EARTHEN CHANNEL WITH CONCRETE PILOT

TYPICAL CHANNEL LINERS

WATAUGA
TEXAS

1-1-98
FIGURE 1D
TYPICAL TRAPEZOIDAL SECTION

BEGIN SLOPE TO EXTRA SIDE WALL HT. ON OUTSIDE WALL

MAX. INCREASE IN WALL HT.

END SLOPE TO EXTRA SIDE WALL HT.

ΔY = EXTRA SIDE WALL HT. = \frac{V^2W}{22R}

WHERE \ V = VELOCITY OF FLOW IN FT./SEC.
\ R = RADIUS OF CURVE IN FT.
\ W = WATER SURFACE WIDTH IN FT.

REINF. AS DIRECTED BY OWNER'S PROJECT REPRESENTATIVE

EXPANSION JT. SPACED AT 100' CENTERS OR AT LEAST ONE JT. PER SECTION OF CHANNEL.

APPROVE SILICONE JT. SEALER

1/2" x 12" SMOOTH DOWELS WITH EXPANSION CAPS AT 18" O.C. GREASED ON ONE END TO BREAK BOND

DETAILS OF REINFORCED CONCRETE CHANNEL LINER

REINFORCED CONCRETE CHANNEL LINER DETAILS

WATAUGA
TEXAS

1-1-98 FIGURE 3D1
TYPICAL TRAPEZOIDAL SECTION

NOTE: SEE PLAN-PROFILE FOR DIMENSIONS "D", "T", "W" AND "X".

BEGIN SLOPE TO EXTRA SIDE WALL HT. ON OUTSIDE WALL

MAX. INCREASE IN WALL HT.

END SLOPE TO EXTRA SIDE WALL HT.

P.T. OF CURVE

VARIES

\( \Delta Y = \text{EXTRA SIDE WALL HT.} = \frac{V^2W}{32R} \)

WHERE
- \( V \) = VELOCITY OF FLOW IN FT./SEC.
- \( R \) = RADIUS OF CURVE IN FT.
- \( W \) = WATER SURFACE WIDTH IN FT.

INCREASE HT. OF OUTSIDE WALL ON CURVE

2-#5 BARS

EXPOSED END

EXPANSION JOINT

REALIZED CONCRETE CHANNEL LINER DETAILS

WATAUGA
TEXAS

1-1-98

FIGURE 3D2
NOTES:

EXTEND EASEMENT WIDTH A MIN. OF 20' BEYOND THE TOP OF CHANNEL BANK EACH SIDE. SLOPES SHALL BE COVERED WITH GRASS APPROVED BY THE PUBLIC WORKS DEPARTMENT TO THE EASEMENT LINE.
SECTION "A-A"

CHANNEL ACCESS RAMP

WEEP HOLE DETAIL AT BOTTOM OF CONCRETE RAMP WALL

NOTE: 3" DIA. WEEP HOLES WITH TWO C.F. EACH OF SAND, PEA GRAVEL AND 1 1/2" ROCK FILTER MEDIA SHALL BE SPACED AT 10' C.C. EACH SIDE ALONG BOTTOM OF RAMP WALL OR AS DIRECTED BY OWNERS RESIDENT PROJECT REPRESENTATIVE.
SECTION "B-B"

N.T.S.

5' (TYP. FOR ACCESS RAMP WALL)
10' (TYP. FOR CHAN. LINER WALL)
1-5/8" DIA. O.D. TOP BRACE RAIL (2.27 LBS. PER FT.)
3/4" x 3/16" TRUSS ROD
NO. 9 GA. CLIPS 2'-0" MAX. O.C. SPACING
1-5/8" O.D. TOP BRACE RAIL (22.27 LBS. PER FT.)
TERMINAL POST CAP
END POST 3-7/8" DIA. O.D. "PERMALINK"
NO. 6 TENSION WIRE TRUSS WALL
4" DIA. PVC SLEEVE FORM IN CONCRETE

GENERAL NOTICES:
1. ALL CONCRETE ITEMS SHOWN ON THIS SHEET SHALL BE CLASS "C" HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS.
2. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE PLACED WITH CENTERS OF THE OUTSIDE LAYER OF BARS 3" FROM THE SURFACE OF THE CONCRETE UNLESS OTHERWISE SHOWN.
4. DIMENSIONS OF REINFORCING BARS ARE TO CENTER OF BARS.
5. EXPANSION JOINTS ALONG ACCESS RAMP SHALL NOT EXCEED 40" LENGTHS.
6. SHOP DRAWINGS WILL BE REQUIRED FOR GATE INSTALLATION FOR REVIEW AND APPROVAL BY ENGINEER AND CITY REPRESENTATIVE.
7. CONSTRUCTION OF 8" HIGH CHAIN LINK FENCE OTHER THAN ALONG PROPOSED CHANNEL LINER OR ACCESS RAMP SHALL INCLUDE FOOTINGS AS FOLLOWS:
   LINE POSTS 8" X 8" X 6" FOOTING
   TERMINAL POSTS 8" X 8" X 6" FOOTING
8. ALL MESH, POSTS AND FITTINGS ARE GALVANIZED STEEL.

CHANNEL ACCESS RAMP

1-1-98

WATAUGA
TEXAS

FIGURE 5D2
NOTE:
FOR PIPE DIAMETER, SEE
PLAN AND PROFILE SHEET.

CONCRETE CHANNEL APRON FOR STORM
DRAIN WITH SLOPING HEADWALL

WATAUGA
TEXAS

1-1-98
FIGURE 7D
COUPLING OF R.C.C. PIPES OF DIFFERENT DIAMETERS

COUPLING OF RCCP TO CGMP

CONCRETE COLLAR DETAILS

CONCRETE COLLAR DETAILS
<table>
<thead>
<tr>
<th>D</th>
<th>X</th>
<th>HOOP BARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>18&quot; OR SMALLER</td>
<td>6&quot;</td>
<td>#3</td>
</tr>
<tr>
<td>LARGER THAN 18&quot;</td>
<td>9&quot;</td>
<td>#4</td>
</tr>
</tbody>
</table>

**STORM DRAIN TAP DETAIL**

**NOTE:** STORM DRAIN TAP SHALL BE CONSIDERED SUBSIDIARY TO COST BID PER L.F. OF LATERAL DRAIN PIPE RESPECTIVELY.

**STORM DRAIN TAP DETAIL**

**NOTE:** PREFABRICATED FITTINGS SHALL BE USED ON ALL PROPOSED STORM DRAINS.
REINFORCEMENT FOR CONCRETE PLUG

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>REINF. BAR</th>
<th>DISTANCE C-C</th>
<th>S</th>
</tr>
</thead>
<tbody>
<tr>
<td>18”–39”</td>
<td>#3</td>
<td>12” E.W.</td>
<td>1/2T</td>
</tr>
<tr>
<td>42”–54”</td>
<td>#3</td>
<td>12” E.W.</td>
<td>1/3T</td>
</tr>
<tr>
<td>60”–72”</td>
<td>#4</td>
<td>12” E.W.</td>
<td>1/4T</td>
</tr>
</tbody>
</table>

NOTE: STEEL HANDLE FOR REINFORCED CONCRETE PIPE PLUG SHALL BE LOCATED 1/4 I.D. ABOVE CENTER POINT OF PLUG. TWO STEEL HANDLES WILL BE REQUIRED ON PLUGS OF 36” PIPES OR LARGER AND SHALL BE PLACED 1/4 I.D. APART AND 1/4 I.D. ABOVE CENTER OF PLUG.

CONCRETE PLUG DETAILS
NO SCALE
SECTION A=A

PLAN VIEW

<table>
<thead>
<tr>
<th>INLET SIZE</th>
<th>T</th>
<th>W</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>2&quot; SQUARE</td>
<td>7&quot;</td>
<td>2'-0&quot;</td>
<td>2'-0&quot;</td>
</tr>
<tr>
<td>4&quot; SQUARE</td>
<td>7&quot;</td>
<td>4'-0&quot;</td>
<td>3'-0&quot;</td>
</tr>
<tr>
<td>5&quot; SQUARE</td>
<td>8&quot;</td>
<td>5'-0&quot;</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>6&quot; SQUARE</td>
<td>9&quot;</td>
<td>6'-0&quot;</td>
<td>4'-0&quot;</td>
</tr>
</tbody>
</table>

NOTES:
1. MATERIAL AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF CITY OF WATAUGA STANDARD SPECIFICATIONS FOR STANDARD CONCRETE MANHOLES. MINIMUM 3000 PSI CONCRETE.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACES SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. FOR DETAILS OF REINFORCING OF LOWER PORTIONS OF INLET SEE APPROPRIATE SQUARE MANHOLE DETAILS.
4. DEPTH OF REINFORCING OF LOWER PORTIONS OF INLET IS VARIABLE. APPROPRIATE DEPTH WILL BE SHOWN ON PLANS AT LOCATION OF INLET.
5. ALL STANDARD DROP INLETS SHALL HAVE ONE OPENING ON EACH SIDE UNLESS OTHERWISE SHOWN ON PLANS.
6. DECK MAY BE REINFORCED SAME AS 4" SQUARE MANHOLE.
BASS & HAYES NO.300-24
(OR APPROVED EQUAL)
MARKED "STORM DRAIN"

1:2 MORTAR

FOUR OR MORE
COURSES 2 1/2"
PRECAST
ADJUSTMENT
RINGS

BARS B-#4 AT 18"

TOP OF PIPE

#4 BARS @ 18" 
OUTSIDE FACE

1"x4" KEY

OR #4 BARS AT 8" C-C 
IN LIEU OF KEYWAY

22 1/2" DIA.

BARS C
#4 BARS @ 18"

BARS T
#4 BARS AT 6" E/W

VERTICAL BARS
#4 BARS AT 18"
(IF WALL HEIGHT
IS OVER 4' USE
STEEL REBAR
SPACERS)

18" R.
(MAX.)

STEEL TROWEL
FINISH

SLOPE 3/8"
TO DRAIN

(5) 1/2"x9" DOWELS AROUND
RING TO BOND BRICK TO SLAB

PAVING SURFACE

#4 BARS AT 6" EACH WAY
HOOKED EACH END

SECTION A-A
N.T.S.

NOTE:
DEPTH "D" SHALL BE
SHOWN ON STORM DRAIN
PLAN AND PROFILE SHEETS

1-1-98
FIGURE 12D1
SECTION B-B

NOTE:
SLOPE INVERT OF MANHOLE AS INDICATED ON PLAN PROFILE SHEET.

SECTION C-C

(VERTICAL BARS NOT SHOWN)

NOTES:
1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.
4. STANDARD 4 FOOT SQUARE MANHOLE SHALL NOT BE USED IF STORM DRAIN PIPE I.D. IS GREATER THAN 36".

STANDARD 4 FOOT SQUARE STORM DRAIN MANHOLE/VAULT

WATAUGA TEXAS

1-1-98 FIGURE 12D2
PLAN
N.T.S.

BASS & HAYES NO.300-24
(OR APPROVED EQUAL)
MARKED "STORM DRAIN"

1:2 MORTAR

FOUR OR MORE COURSES 2 1/2" PRECAST ADJUSTMENT RINGS

BARS B
#4 @ 18"

TOP OF PIPE

#4 BARS @ 18"
OUTSIDE FACE

#5 BARS @ 18"
INSIDE BARS @ 6"

1"x4" KEY

OR #4 BARS AT 8" C-C IN LIEU OF KEYWAY

SECTION A-A
N.T.S.

NOTE:
DEPTH "D" SHALL BE SHOWN ON STORM DRAIN PLAN AND PROFILE SHEETS

STANDARD 5 FOOT SQUARE STORM DRAIN MANHOLE/VAULT

WATAUGA TEXAS

1-1-98 FIGURE 13D1
NOTES:
1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.
SECTION B-B
N.T.S.

#4 DOWELS @ 18" ALL AROUND EXCEPT IN WAY OF PIPE

#5 BARS @ 8" E.W.

NOTE:
SLOPE INVERT OF MANHOLE AS INDICATED ON PLAN-PROFILE SHEET.

SECTION C-C
(VERTICAL BARS NOT SHOWN)
N.T.S.

NOTES:
1. MATERIALS AND WORKMANSHIP SHALL CONFORM WITH THE REQUIREMENTS OF STANDARD SPECIFICATION FOR STANDARD MANHOLES.
2. LAYERS OF REINFORCING STEEL NEAREST THE INTERIOR AND EXTERIOR SURFACE SHALL HAVE A COVER OF 2" TO THE CENTER OF BARS, UNLESS OTHERWISE NOTED.
3. EXCAVATION FOR MANHOLE TO BE INCLUDED IN UNIT PRICE BID FOR MANHOLE.

STANDARD 6 FOOT SQUARE STORM DRAIN MANHOLE/VAULT

WATAGA
TEXAS

1-1-98 FIGURE 14D2
SECTION "B-B"
N.T.S.

GUTTER POINT TO REMAIN ON THIS LINE AND CONSTANT AT 2"

ATTACH 24" STAINLESS STEEL CHAIN WITH ANCHOR BOLT.

SECTION "A-A"
N.T.S.

NOTES:
1. ALL CONCRETE SHALL BE 3000 P.S.I. COMPRESSIVE STRENGTH CONCRETE AT 28 DAYS.
2. REINFORCING BARS SHALL BE STANDARD, BILLET STEEL, DEFORMED REINFORCING BARS OF A DIAMETER AND LENGTH AS SHOWN.
3. CHAMFER ALL EXPOSED CORNERS 3/4" EXCEPT WHERE OTHERWISE NOTED.
4. DIMENSIONS RELATING TO REINF. STEEL ARE TO CENTERS OF BARS.
5. FIELD CUT & BEND BARS AS NECESSARY TO ACCOMMODATE STORM SEWER PIPE.
6. CAST IRON CASTINGS SHALL CONFORM TO T.H.D. ITEM 471.
7. RING AND COVER SHALL BE PROVIDED AND INSTALLED BY THE CONTRACTOR.
8. DURING STAGE 1 CONSTRUCTION, INLETS WILL NOT BE CONSTRUCTED ABOVE SUBGRADE ELEVATION UNLESS PERMITTED BY THE ENGINEER.
9. A TEMPORARY WOOD COVER SHALL BE INSTALLED AFTER STAGE 1 IS COMPLETED AND WILL REMAIN IN PLACE UNTIL STAGE 2 IS BEGUN.

STANDARD CURB INLET

WATAUGA
TEXAS

1-1-98 03-12-04 FIGURE 16D2
DROP INLET PROTECTION
N.T.S.

CURB INLET PROTECTION
N.T.S.
NOTES:

1. CLASS "A" CONCRETE SHALL SHALL HAVE 5 SACKS OF CEMENT/C.Y., MAXIMUM SLUMP OF 5 INCHES, AND A 3000 PSI COMPRRESSIVE STRENGTH AT 28 DAYS.

2. ALL ITEMS SHOWN INCLUDED IN VALVE & BOX UNIT PRICE, COMPLETE IN PLACE.

3. ALL WATER VALVES SHALL MEET THE MINIMUM REQUIREMENTS OF AWWA C509 AND SHALL BE MUELLER A–2380, WATEROUS SERIES 500, CLOW MODEL F–6100, AMERICAN DARLING MODEL CRS–80–NRS OR APPROVED EQUAL.

4. RAINTOPPER REQUIRED IN VALVE BOX.

5. SEE DETAIL 09W FOR PIPE RESTRAINT DETAILS.
NOTES:

1. CONCRETE SHALL BE PLACED OR POURED AGAINST UNDISTURBED SOIL.

2. ALL FIRE HYDRANTS SHALL CONFORM TO WATAUGA SPECIFICATIONS AND SHALL BE MUELLER SUPER MODEL A-423 (CENTURION 200), WATEROUS MODEL WB-67DD9-635, AMERICAN DARLING MODEL B-84-B, CLOW MODEL 2546-5-B (MEDALLION).

3. NO SEPARATE PAY FOR EXTENSIONS TO FINISHED GRADE.

4. ALL PORTIONS (EXCLUDING CHAINS) OF FIRE HYDRANT ABOVE GRADE SHALL BE PAINTED WITH TNE MEC SERIES 02H HI-BUILD TNE MEC-GLOSS. COLOR (PRIMED): CHILEAN RED.

5. ALL FIRE HYDRANT GATE VALVES SHALL BE ANCHORED TO THE MAIN AS DIRECTED BY THE CITY REPRESENTATIVE.
NOTE: OFFSET FIRE HYDRANT FROM PROPERTY LINE WHEN WATER METERS ARE TO BE INSTALLED AT THE SAME LOCATION. "B" SHALL BE 30" TO 42". "A" SHALL BE 12" LESS THAN "B".
6" x 24" CURB & GUTTER

HAYWOOD #1730-18

1'-6" TYP.

2" ANGLE BALL VALVE
Ford BFA43-777WR
(FLANGE X COMPRESSION)

2" TYPE "K" SOFT COPPER

6" SAND FILL

6" TYP.

WATER MAIN

Ford FB1000-7-G
CORPORATION STOP
(CCxCOMPRESSION)

DOUBLE STRAP
BRONZE SADDLE
Ford 202BS

NOTE:
IF SERVICE IS INSTALLED AHEAD OF CURB & GUTTER, CUT AND SHAPE PIPE TO FIT POSITION SHOWN BUT BEND DOWN ABOUT 5 INCHES TO MINIMIZE CHANCES OF DAMAGE DURING CONSTRUCTION OF CURB AND GUTTER. SERVICE LINE COVER MINIMUM 24 INCHES, UNDER STREET SUBGRADE.

DETAIL FOR 2" WATER SERVICE
NOTES:
1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF
   WATAUGA STANDARDS AND SPECIFICATIONS.
2. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS
   WITH A MAXIMUM SLUMP OF 4 INCHES.
3. ALL REINFORCING STEEL WILL BE CONTINUOUS AROUND CORNERS WITH MIN.
   LAP OF 24 INCHES.
4. BILCO UD K-5 (3.5"x3.5") OR APPROVED EQUAL SHALL BE INSTALLED IN TOP.
   CONTRACTOR SHALL FURNISH TWO (2) BILCO KEY WRENCHES WITH EACH
   INSTALLATION.
5. ALL DUCTILE IRON WATER PIPE SHALL MEET SPECIFICATION ANSI/AWWA–
   C150/A21.50 CLASS 50 WITH 8 MIL POLYETHYLENE TUBE WRAP AND CEMENT
   LINING ACCORDING TO ANSI/AWWA–C104/A21.4.
6. FAILURE TO OBTAIN PROPER INSPECTION WILL RESULT IN UNCOVERING ALL
   PIPE AND FITTINGS FOR REINSPECTION.
NOTES:
1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATAUGA STANDARDS AND SPECIFICATIONS.
2. CONCRETE SHALL HAVE A COMPRESSIVE STRENGTH OF 3,000 PSI AT 28 DAYS WITH A MAXIMUM SLUMP OF 4 INCHES.
3. ALL REINFORCING STEEL WILL BE CONTINUOUS AROUND CORNERS WITH MINIMUM LAP OF 24 INCHES.
4. BILCO LID K-5 (3.5"x3.5") OR APPROVED EQUAL SHALL BE INSTALLED IN TOP. CONTRACTOR SHALL FURNISH TWO (2) BILCO KEY WRENCHES WITH EACH INSTALLATION.
5. ALL DUCTILE IRON WATER PIPE SHALL MEET SPECIFICATION ANSI/AWWA-C150/A21.50, CLASS 50 WITH 8 MIL POLYETHYLENE TUBE WRAP AND CEMENT LINING ACCORDING TO ANSI/AWWA-C104/A21.4.
6. FAILURE TO OBTAIN PROPER INSPECTION WILL RESULT IN UNCOVERING ALL PIPE AND FITTINGS FOR REINSPECTION.

IRRIGATION 4" METER INSTALLATION
NOTES:
1. ALL CONSTRUCTION TO BE IN ACCORDANCE WITH THE CITY OF WATAUGA STANDARDS AND SPECIFICATIONS.
2. CONTRACTOR SHALL NOTIFY CITY FIRE INSPECTOR AT 817/514-5870 AT LEAST 48 HOURS PRIOR TO BEGINNING INSTALLATION.
3. ALL UNDERGROUND PIPE AND FITTINGS FOR FIRE LINE TO BE VISUALLY INSPECTED BY CITY FIRE INSPECTOR AND PRESSURE TESTED PRIOR TO BEING BACKFILLED.
4. ALL PROPOSED TAPS ON THE EXISTING WATER MAINS FOR PROPOSED FIRE LINES SHALL BE COORDINATED WITH THE PUBLIC WORKS/UTILITIES INSPECTOR AT 817/514-5806.
5. CONCRETE SHALL A COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS WITH A MAXIMUM SLUMP OF 4 INCHES.
6. ALL REINFORCING STEEL WILL BE CONTINUOUS AROUND CORNERS WITH MINIMUM LAP OF 24 INCHES.
7. BILCO LID K-5 (3.5'x3.5') OR APPROVED EQUAL SHALL BE INSTALLED IN TOP. CONTRACTOR SHALL FURNISH 2 BILCO KEY WRENCHES WITH EACH INSTALLATION.
8. ALL DUCTILE IRON WATER PIPE SHALL MEET SPECIFICATION ANSI/AWWA-C150/A21.50, CLASS 50 WITH 8 MIL POLYETHYLENE TUBE WRAP AND CEMENT LINING ACCORDING TO ANSI/AWWA-C104/A21.4.
9. FAILURE TO OBTAIN PROPER INSPECTION WILL RESULT IN UNCOVERING ALL PIPE AND FITTINGS FROM MAIN LINE TO BUILDING FOR REINSPECTION AND POSSIBLE RECONSTRUCTION.

DETECTOR CHECK INSTALLATION DETAILS

WATAUGA
TEXAS

1-1-98  8/6-25-99  FIGURE 8W
USE EBAA IRON "MEGALUG" SERIES
2500 RESTRAINT HARNESS FOR C-900
OR C-905 PVC PIPE FITTINGS

PVC PIPE FITTINGS TO PVC PIPE
Not To Scale

USE EBAA IRON "MEGALUG" SERIES
1600 RESTRAINT HARNESS FOR C-900
OR SERIES 2800 RESTRAINT FOR
C-905 PVC PIPE TO PIPE

PVC PIPE TO PVC PIPE
Not To Scale

USE EBAA IRON "MEGALUG" SERIES
2000PV RESTRAINT GLAND FOR
MECHANICAL JOINT TO C-900 OR
C-905 PVC PIPE

MJ RESTRAINT GLAND
MJ PIPE FITTINGS TO PVC PIPE
Not To Scale

USE EBAA IRON "MEGALUG" SERIES
1100 RESTRAINT GLAND FOR
MECHANICAL JOINT TO DUCTILE IRON
PIPE

MJ RESTRAINT GLAND
MJ PIPE FITTINGS TO DI PIPE
Not To Scale

NOTE:  USE EBAA IRON "MEGALUG"
SERIES 2100 RESTRAINED FLANGE
ADAPTER FOR FLANGE TO DUCTILE IRON
OR PVC PIPE CONNECTION.

EBAA IRON "MEGALUG" SERIES RESTRAINTS
SHALL BE USED AT ALL MECHANICAL JOINT
FITTINGS AND ON PIPE JOINTS WHERE
INSUFFICIENT LENGTH OF STRAIGHT PIPE IS
SUPPORTED IN TRENCH.

INSTALL IN ACCORDANCE WITH
MANUFACTURER'S INSTRUCTIONS.
NOTES:
1. TEST POINT BOXES SHALL BE INSTALLED 18" FROM AND ADJACENT TO EACH FIRE HYDRANT GATE VALVE IN PARKWAY AS REQUIRED.
2. THE 10 GA. COPPER WIRE SHALL BE INSTALLED CONTINUOUS WITH NO SPLICES IN THE WIRE OTHER THAN IN THE TEST POINT BOXES AS SHOWN.
3. TWIST THE BARE COPPER WIRES AND CLAMP WITH APPROPRIATE BRONZE ALLOY SPLIT-BOLT CONNECTOR.
USE EBAA IRON "MEGALUG" SERIES 2000PV RESTRAINT GLAND FOR MECHANICAL JOINT TO C-900 OR C-905 PVC PIPE

CONCRETE BLOCKING (TYPICAL)

16" VERTICAL GATE VALVE AND BOX OR LARGER

6" GATE VALVE AND BOX

16" DIA. OR LARGER

6" PVC

USE EBAA IRON "MEGALUG" SERIES 1100 RESTRAINT GLAND FOR MECHANICAL JOINT TO DUCTILE IRON PIPE

NOTES:
1. EMBEDMENT AND BACKFILL FOR BY-PASS TO BE THE SAME AS THE MAIN LINE.
2. BY-PASS TO BE PAID FOR AT UNIT PRICE FOR EACH COMPLETE IN PLACE INCLUDING 6" GATE VALVE, MAIN LINE TEES, 90d BENDS, AND 6" PVC PIPE.

WATAUGA
TEXAS

11-5-2002

FIGURE 11W
SANITARY SEWER MANHOLE DETAILS

NOTES:
1. STANDARD CAST-IN-PLACE CONCRETE MANHOLE TO BE USED WITH SEwers 6" THROUGH 36" IN DIAMETER WHERE SPECIFIED.
2. THE CONNECTION OF THE SEWER PIPE TO THE MANHOLE SHALL BE ACCOMPLISHED BY USING MANHOLE COUPLING OR RUBBER RING WATER STOPS AS RECOMMENDED BY THE PIPE MANUFACTURER.
3. CLASS "A" CONCRETE SHALL HAVE 5 SACKS CEMENT/C.Y., MAXIMUM SLUMP OF 5", AND A 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
4. SERVICES WHICH ARE CONNECTED TO MANHOLES SHALL BE INSTALLED A MINIMUM OF 8 INCHES ABOVE THE MAIN FLOWLINE.
5. RAINSTOPPER REQUIRED IN MANHOLE.
TYPICAL 48" DIA. MANHOLE
(WITH PRECAST BASE & FACTORY INVERT)

N.T.S.

1. PRECAST MANHOLE TO MEET ALL REQUIREMENTS OF ASTM C-478.
2. O’RING GASKET JOINT REQUIRED IN ACCORDANCE WITH ASTM C-443.
3. SERVICES WHICH ARE CONNECTED TO MANHOLES SHALL BE INSTALLED A MINIMUM OF 8 INCHES ABOVE THE MAIN FLOWLINE.
4. EACH INDIVIDUAL SECTION OF THE PRECAST MANHOLE WILL NEED TO BE STAMPED WITH THE ASTM SPECIFICATION NUMBER, THE MANUFACTURER’S NAME, AND DATE MANUFACTURED.
5. RAINSTOPPER REQUIRED IN MANHOLE.
CAST IRON MANHOLE FRAME AND COVER (TO BE FURNISHED AND INSTALLED BY CONTRACTOR). BASS & HAYS PATTERN #300-24 WITH PICK BARS OR EQUAL MARKED "SANITARY SEWER".

NATURAL GRADE

SET IN MORTAR

MONOLITHICALLY PLACED CLASS "A" CONCRETE

ADDITIONAL DEPTH OVER 5'-0'

EXTRA PAY PER L.F.

6" THICK 3000 PSI CONC.

2'-6"

2'-0"

3/8" STAINLESS STEEL ANCHOR BOLT

NUTS

WASHER

1/8"x1" WIDE STAINLESS STEEL STRAP 2' SPACING MINIMUM

PVC PIPE

NOTES:
1. STANDARD CAST-IN-PLACE MANHOLE TO BE USED WITH SEWERS 6" THROUGH 8" DIA. WHERE SPECIFIED.
2. THE CONNECTION OF THE SEWER PIPE TO THE MANHOLE SHALL BE ACCOMPLISHED BY USING MANHOLE COUPLING OR RUBBER RING WATER STOPS AS RECOMMENDED BY THE PIPE MANUFACTURER.
3. CLASS "A" CONCRETE SHALL HAVE 5 SACKS CEMENT/C.Y., MAXIMUM SLUMP OF 5", AND A 3000 PSI COMpressive STRENGTH AT 28 DAYS.
4. RAINSTOPPER REQUIRED IN MANHOLE.

SANITARY SEWER DROP MANHOLE DETAILS

WATAUGA
TEXAS

1-1-98

FIGURE 3S
SEWER SERVICE CONNECTIONS

NOTES:
1. TOP OF SERVICE SHALL BE SUFFICIENT DEPTH TO PROVIDE ADEQUATE FALL FROM THE Facility TO BE SERVED.
2. CLASS "A" CONCRETE SHALL HAVE 5 SACKS OF CEMENT, MAXIMUM SLUMP OF 5 INCHES, AND 3000 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
MANHOLE VENT DETAIL
NOT TO SCALE

NOTES:
1. MANHOLE VENTS SHALL BE PROVIDED ON EVERY FOURTH MANHOLE COVER. ACTUAL LOCATIONS SHALL BE AS DIRECTED BY OWNER’S PROJECT REPRESENTATIVE. INCLUDE IN PRICE BID PER EACH FOR TYPE “A” AND “B” MANHOLES.

2. ALL COMPONENT PARTS OF MANHOLE VENT SHALL BE GALVANIZED. IF SPECIFIC PARTS CANNOT BE GALVANIZED, THEN CONTRACTOR SHALL PAINT THE PARTS WITH A GALVANIZED BASE PAINT. A FINAL COAT OF ORANGE PAINT WILL BE APPLIED TO THE VENT PIPE TO INCREASE ITS VISIBILITY.

3. EQUIVALENT REMOVABLE TYPE CONNECTION TO MANHOLE LID SHALL BE SUBMITTED TO ENGINEER FOR POSSIBLE APPROVAL.

4. ACTUAL LOCATION OF VENT PIPE DOES NOT HAVE TO BE IN CENTER AS SHOWN AND CAN BE OFFSET TO BETTER SUIT STRUCTURAL CONFIGURATION OF MANHOLE LID.

5. ALL THREADED PIPES AND FITTINGS SHALL BE CAULKED TO FORM WATERTIGHT INTEGRITY.
NOTES: 
1. CONNECTION/PENETRATION OF THE SEWER PIPE INTO THE MANHOLE SHALL BE ACCOMPLISHED BY USING RESILIENT CONNECTORS CONFORMING TO ASTM C 923.

2. CONTRACTOR MAY USE PVC FITTINGS IN LIEU OF DUCTILE IRON FITTINGS FOR NOMINAL PIPE SIZES UP TO 15". DUCTILE IRON FITTINGS SHALL BE USED FOR PIPES LARGER THAN 15" NOMINAL.

3. PIPE STRAPS TO BE SPACED AT 5' CENTERS. MINIMUM 2 STRAPS PER MANHOLE DROP.

4. RAINSTOPPER REQUIRED IN MANHOLE.