JEFF MORTENSEN & ASSOCIATES, INC.
6010-B MIDWAY PARK BLVD. N.E.
ALBUQUERQUE · NEW MEXICO 87109
ENGINEERS · (505) 345-4250

WATERSHED MAP

COVENANT UNITED METHODIST CHURCH

JEFFREY G. MORTENSEN · NEW MEXICO · 8547 · REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY	J.G.M.
DRAWN BY	T.P.H.
APPROVED BY	J.G.M.

NO	DATE	BY	REVISIONS
1	08/93	MFD	ADD FUTURE DEVELOPED RUNOFF FROM CHURCH SITE

JOB NO	920412
DATE	06/93
SHEET 1 OF 6	

DRAINAGE ANALYSIS

The following analysis has been prepared to determine the extent of public infrastructure required in conjunction with the development of the Covenant United Methodist Church. The required infrastructure for drainage is related to conformance with the Drainage Ordinance. Criteria as stated in the Development Process Manual are as follows:

a. "in the event of the 10-year design discharge [depth] may not exceed 0.5 feet in any collector or ARTERIAL street. One lane free of flowing or standing water in each traffic direction must be preserved on arterial streets."

b. "The product of depth times velocity (dv) shall not exceed 6.5 in any location of any street in the event of a 10-year design storm."

v = fps; d = depth above gutter flowline.

As shown on the Watershed Map, four drainage basins contribute runoff to Wilshire Avenue N.E., a local street. In addition, two drainage basins contribute runoff to Wyoming Boulevard N.E., a Principal Arterial. Because the tabulated discharge rates exceed the above referenced criteria for street flow, an underground storm drain system has been identified. As shown on the paving plan and profile sheets, street grades have been established and storm inlets located on both Wilshire Avenue N.E. and Wyoming Boulevard N.E. The storm drain will ultimately drain south to discharge to the North Arroyo de Domingo Baca. The gradient of storm drain piping has been established equal to the street gradient.

The calculations which appear hereon analyze the existing and developed conditions for the 100-year, 6-hour rainfall event. Where discharge rates and volumes have been previously identified, those values have been reprinted below. Where values did not presently exist, current calculations have been performed. Using the Procedure for 40 Acre and Smaller Basins set forth in the Revision of Section 22.2, Hydrology of the Development Process Manual, Volume 2, Design Criteria, dated August 1991, normal depth street flow has been calculated by the Manning Equation. For supercritical conditions, the sequent depth method has been used. Storm inlet grating capacities have been evaluated using the nomographs set forth in the DPM and reprinted hereon. Pipe flow capacities are calculated using the Manning Equation.

CALCULATIONS

I. HYDROLOGY

Site Characteristics

1. Precipitation Zone 3
2. $P_{6,100} = P_{360} =$ 2.60
3. Total Area (A_T)
4. Land Treatments
   a. Tierra La Cueva - Unit 2 (refer to C19/D9A)
   b. La Cueva High School (refer to C19/D1)
   c. Wilshire Avenue (A_T = 3.44 Ac)

Treatment	Area (sf/ac)	%
C	32,500/0.74	21.7
D	117,500/2.70	78.3

   d. Wyoming Boulevard (A_T = 0.98 Ac)

Treatment	Area (sf/ac)	%
B	12,600/0.29	29.4
C	13,800/0.31	32.2
D	16,500/0.38	38.4

5. Developed Land Treatment
   a. Tierra La Cueva - Unit 2 - No Change
   b. La Cueva High School - No Change
   c. Wilshire Avenue

Treatment	Area (sf/ac)	%
C	20,000/0.46	13.3
D	130,000/2.98	86.7

   d. Wyoming Avenue

Treatment	Area (sf/ac)	%
B	12,600/0.29	29.4
C	7,700/0.18	18.0
D	22,550/0.52	52.6

Existing Condition

A. Tierra La Cueva - Unit 2 (from C19/D9A)
V_{100} = 33,300 cf
Q_{100} = 21.9 cfs

B. La Cueva High School (from C19/D1)
1. Basin A
V_{100} = 166,670 cf
$Q_{100} = Q_{release}$ = 8.2 cfs
2. Basin B
V_{100} = 22,080 cf
$Q_{100} = Q_{release}$ = 4.5 cfs
3. Basin C
V_{100} = 11,750 cf
Q_{100} = 6.8 cfs

C. Wilshire Avenue
E_W = [(1.29)(0.74)+(2.36)(2.70)]/3.44 = 2.13 in
V_{100} = $(E_W/12)A$ = 0.61 ac. ft. = 26,600 cf
Q_{100} = 3.45(0.74) + 5.02(2.70) = 16.1 cfs

D. Wyoming Boulevard
E_W = [(0.92)(0.29)+(1.29)(0.31)+(2.36)(0.38)]/0.98 = 1.60 in
V_{100} = $(E_W/12)A$ = 0.13 ac. ft. = 5,700 cf
Q_{100} = 2.60(0.29) + 3.45(0.31) + 5.02(0.38) = 3.7 cfs

Developed Condition

A. Tierra La Cueva - Unit 2 - No Change
B. La Cueva High School - No Change
C. Wilshire Avenue
E_W = [(1.29)(0.46)+(2.36)(2.98)]/3.44 = 2.22 in
V_{100} = (2.22/12)(3.44) = 0.64 ac.ft. = 27,750 cf
Q_{100} = 3.45(0.46)+5.02(2.98) = 16.5 cfs
D. Wyoming Boulevard
E_W = [(0.92)(0.29)+(1.29)(0.18)+(2.36)(0.52)]/0.98 = 1.76 in
V_{100} = (1.76/12)(0.98) = 0.14 ac.ft. = 6,300 cf
Q_{100} = 2.60(0.29) + 3.45(0.18) + 5.02(0.52) = 4.0 cfs
E. Covenant United Methodist Church (Full Development) (From the Conceptual Plan)
1. Basin A
V_{100} = 16,300 cf
Q_{100} = 10.1 cfs
$V_{10\ day}$ = 30,150 cf
2. Basin B
V_{100} = 10,800 cf
Q_{100} = 6.7 cfs
$V_{10\ day}$ = 20,040 cf

Comparison

A. Wilshire Avenue
1. Volume
$V_{T,\ Exist.}$ = 33,300 + 22,080 + 11,750 + 26,600 = 93,730 cf
$V_{T,\ Dev.}$ = 33,300 + 22,080 + 11,750 + 27,750 = 94,880 cf
ΔV_{100} = 94,880 - 93,730 = 1150 cf (increase)
2. Discharge
$Q_{T,Exist.}$ = 21.9 + 4.5 + 6.8 + 16.1 = 49.3 cfs
$Q_{T,\ Dev.}$ = 21.9 + 4.5 + 6.8 + 16.5 = 49.7 cfs
ΔQ_{100} = 49.7 - 49.3 = 0.4 cfs (increase)

B. Wyoming Boulevard
1. Volume
$V_{T,\ Exist.}$ = 166,670 + 5,700 +4,990 + 10,800 = 188,160 cf
$V_{T,\ Dev.}$ = 166,670 + 6,300 + 16,300 + 10,800 = 200,070 cf
ΔV_{100} = 200,070 - 188,160 = 11,910 cf (increase)
2. Discharge
$Q_{T,Exist.}$ = 8.2 + 3.7 + 6.7 + 4.0 = 22.6 cfs
$Q_{T,\ Dev.}$ = 8.2 + 4.0 + 10.1 + 6.7 = 29 cfs
ΔQ_{100} = 29.0 - 22.6 = 6.4 cfs (increase)

II. STREET HYDRAULICS

Normal depth is calculated for both streets using Manning's Equation. The sequent depth is used for Wilshire Avenue to determine total flow depth including the hydraulic jump depth.

Input Criteria:

a) Manning's n = 0.017
b) Cross sectional geometry
c) Normal depth

A. Wilshire Avenue N.E.

A_n = 4.08 sf
A_s = 2.47 sf
P_n = 20.484 ft
P_s = 15.85 ft
$R^{2/3} = (A/P)^{2/3}$
$S^{1/2}$ = 0.1892 (@ 0.0358 slope)
Q_{10} = 35 cfs

Max $Q_{capacity}$ of one side of road before it flows over the crown is 23.1 cfs, so the rest flows to the south side of the road (11.9 cfs)
Q_n = 23.1 cfs @ d = 0.484'
Q_s = 11.3 cfs @ d = 0.388'

Use Sequent Depth Method due to supercritical flow in Wilshire Avenue N.E.

$d_{seq} = 0.5d_1[(1+8F^2)^{1/2} - 1]$ (eq. 3-21 from Open Channel Hydraulics by Ven Te Chow)
$F = v / (gd_1)^{1/2}$

V = Q/A;
G = 32.2 ft/sec²
$V_n = Q_n/A_n$ = 23.1/4.08 = 5.66 fps
$V_s = Q_s/A_s$ = 11.3/2.38 = 4.75 fps
F_n = 1.43
F_s = 1.35

$d_{n,seq}$ = 0.77 ft < 0.87 ft (max. allowable depth in street)
$d_{s,seq}$ = 0.58 ft < 0.87 ft (max. allowable depth in street)

dv = (d)(v)
dvn = (0.484)(5.66) = 2.74 < 6.5 max. allowable; satisfies criteria
dvs = (0.388)(4.75) = 1.84 < 6.5 max. allowable; satisfies criteria

$d_{100} > d_{crown}$ then let flow be evenly distributed so both sides of the road will have a Q of 25.3 cfs
Q = 25.3 cfs
A = 4.29 sf
P = 20.495 ft
R = $(A/P)^{2/3}$
d = 0.495 ft

Use Sequent Depth Method due to supercritical flow in Wilshire Avenue N.E.
$d_{seq} = 0.5d_1[(1+8F^2)^{1/2} - 1]$
$F = v / (gd)^{1/2}$
g = 32.2 ft/sec²
V = Q/A;
V = 5.90 ft/sec
F = 1.48
d_{seq} = 0.818 ft < 0.87 ft (max. allowable depth in street)

dv = (0.495)(5.9) = 2.92 < 6.5 max. allowable; satisfies criteria

B. Wyoming Boulevard N.E.

Q that leaves one free lane (required for Q_{10})
Manning's Equation is used to calculate discharge.
n = 0.017
A = 5.61 sf
$R^{2/3} = (A/P)^{2/3}$
P = 24.05 ft
$S^{1/2} = (0.005)^{1/2}$

$Q_{allowable}$ = 13.2 cfs @ d = 0.56'

Q at maximum curb height = 8"
n = 0.017
A = 8.54 sf
P = 29.75 ft
R = $(A/P)^{2/3}$
$S_o = (0.005)^{1/2}$

Q = 23.1 cfs @ d = 0.67'

III. INLET CAPACITIES

A. Wilshire Avenue N.E.: Q_{100} = 50.6 cfs

1. For Q_{100}
   a. Single 'A' Storm Inlet (1st in series)
   Q_{cap} = 9.2 cfs (each side of street)
   b. Double 'C' Storm Inlet (2nd in series)
   Q_{cap} = 8.6 cfs (each side of street)
   c. Double 'C' Storm Inlet (3rd in series)
   Q_{cap} = 5.5 cfs (each side of street)
   (3.0 cfs to Wyoming Blvd. N.E.)

B. Wilshire Avenue N[illegible] = [illegible] cf[illegible] [illegible].1 cfs,
Q_s = 11.3

1. Single 'A' [illegible]torm [illegible] 1st [illegible] series [illegible] side')
$Q_{n,cap}$ = 8.8 cfs
Single 'A' Storm Inlet [illegible] series 'south side')
$Q_{s,cap}$ = 6.6 cfs
2. Double 'C' Storm Inlet [illegible] in series [illegible] side')
$Q_{n,cap}$ = 8.4 cfs
Double 'C' Storm Inlet 2nd in series [illegible] side')
$Q_{s,cap}$ = 4.2 cfs
3. Double 'C' Storm Inlet ([illegible] series 'north side')
$Q_{n,cap}$ = 4.6 cfs
Double 'C' Storm Inlet (3r[illegible] in series 'south side')
$Q_{s,cap}$ = 1.[illegible] cfs
[illegible] cfs only needed
(Q_n = [illegible] cfs to Wyoming Blvd. N.E. from 'north side')
(Q_s = 0.[illegible] cfs to Wyoming Blvd. N.E. from 'south side')

C. Wyoming Boulevard N.E.

1. Wyoming Boulevard N.E.: Q_{100} = 12.2 cfs
   + Intersection Q = 3.1 cfs
   Q = 15.3 cfs

   a. Single 'A' Storm Inlet (South of Intersection)
   Q_{cap} = 6.0 cfs
   b. Double 'C' Storm Inlet (South of Intersection)
   Q_{cap} = 5.2 cfs

   $Q_{remaining}$ = 4.1 cfs
   It meets with United Methodist Church Runoff
   Q = 16.8 cfs
   Q_{max} = 20.9 cfs

2. Wyoming Boulevard N.E.: Q_{10} = 10.7 cfs
   + Intersection Q = 1.3 cfs
   Q = 12.0 cfs

   a. Single 'A' Storm Inlet (South of Intersection)
   Q_{cap} = 5.4 cfs
   b. Double 'C' Storm Inlet (South of Intersection)
   Q_{cap} = 3.9 cfs

   $Q_{remaining}$ = 2.7 cfs
   It meets with United Methodist Church Runoff
   Q = 11 cfs
   Q_{max} = 13.7 cfs

D. Wilshire Avenue: Q_{100} = 49.7
(Divide by two because of 2 sets of inlets on each side)

25.3 cfs → Passes a Type 'A' Storm Drain
It leaves with 15.65 cfs above ground 9.2 cfs in Inlet
Total = 9.5 cfs
18" RCP = 9.2 cfs 18" Max Q = 15 cfs O.K. @ 2% slope

15.8 cfs → Passes a Type Double 'C'
8.6 cfs in Inlet, Total = 17.8 cfs
24" RCP = 17.8 cfs 24" Max Q = 32 cfs O.K. @ 2% slope
it leaves with 7.05 cfs above ground

7.05 cfs → Passes a Type Double 'C'
5.5 cfs in Inlet, Total = 23.3 cfs
24" RCP = 23.3 cfs 24" Max Q = 32 cfs O.K. @ 2% slope
it leaves 1.55 cfs above ground

It reaches manhole where north and south RCP meet
so Q = 46.6 cfs
42" RCP = 46.6 cfs 42" Max = 73 cfs @ ½% slope

3.1 cfs above ground meets $Q_{Wyoming}$ =11.2 cfs = 15.3 cfs

Water above ground meets a single 'A' inlet on Wyoming
It takes 6.0 cfs
9.3 cfs above ground
Q_{drain} = 52.6 cfs
42" RCP = 52.6 cfs 42" Max = 73 cfs @ ½% slope

9.3 cfs meets Double 'C' Storm Drain
It takes 5.2 cfs
Q_{drain} = 57.8 cfs $Q_{outside}$ = 4.1 cfs
It meets United Methodist Church Runoff
Q = 16.8 cfs
Q_{max} = 20.9 cfs
23.1 cfs > 20.9 cfs so it is o.k. for 100 year Q

E. Wilshire Avenue: Q_{10} = 34.4 cfs
Q_n = 23.1 cfs
Q_s = 11.3 cfs

Calcs for Q_n

23.1 cfs → passes a Type 'A' Storm Drain
8.8 cfs in inlet Total Q = 8.8 cfs
18" RCP = 8.8 cfs Max = 15 cfs @ 2% slope
14.3 cfs above ground

14.3 cfs → passes a Type 'C' Storm Drain
8.4 cfs in inlet Total Q = 17.2 cfs
24" RCP = 17.2 cfs Max = 32 cfs @ 2% slope
5.9 cfs above ground

5.9 cfs → passes a Type Double 'C' Storm Drain
4.6 cfs in inlet Total Q = 22 cfs
24" RCP = 21.8 cfs Max = 32 cfs @ 2% slope
$Q_{outside}$ = 1.3 cfs

Calcs for Q_s

11.3 cfs → passes a Type 'A' Storm Drain
6.6 cfs in inlet Total Q = 6.8 cfs
18" RCP = 6.6 cfs Max = 15 cfs @ 2% slope
4.7 cfs above ground

5.1 cfs → passes a Type Double 'C' Storm Drain
4.2 cfs in inlet Total Q = 11.1 cfs
24" RCP = 10.8 cfs Max = 32 cfs @ 2% slope
0.5 cfs above ground

0.5 cfs → passes a Type Double 'C' Storm Drain
0.5 cfs in inlet Total Q = 11.3 cfs
24" RCP = 11.3 cfs Max = 32 cfs @ 2% slope

Q_n & Q_s join to a 42" RCP (manhole)
Total Q = 21.8 + 11.3 = 33.1
42" RCP = 33.1 cfs 42" Max = 72 cfs @ ½% slope
1.3 cfs above ground
Outside joins with 10.7 cfs to become 12 cfs
It meets a single 'A' Storm Inlet after inlet has drained
It takes 5.4 cfs from 18" line
Q_{tot} = 38.5 cfs
$Q_{outside}$ = 6.6 cfs

It meets a double 'C' Storm Inlet after inlet has drained from 18" line

It takes 3.9 cfs
Q_{tot} = 42.4 cfs
$Q_{outside}$ = 2.7 cfs
It meets United Methodist Church Runoff Q = 11.0 cfs
$Q_{outside}$ = 13.7 cfs
13.7 cfs ≈ 13.2 cfs so it is o.k. for 10 year Q

Storm Drain Hydraulics Pipe Flow

Using Feild's Hydraulics Calculator for Gravity Flow in Pipes

d = 18"	n = 0.013	s = 0.02	Q_{cap} = 15.0
d = 18"	n = 0.013	s = 0.005	Q_{cap} = 7.6
d = 24"	n = 0.013	s = 0.02	Q_{cap} = 32.0
d = 24"	n = 0.013	s = 0.005	Q_{cap} = 16.0
d = 42"	n = 0.013	s = 0.005	Q_{cap} = 72.0

△2 1. Street Hydraulics on Wyoming (1 dry driving lane)
n = 0.017
d = 0.555
A = 5.66 sf
P = 24.00 ft
Q = 13.4 cfs

Free lane = 11.5 ft ≈ 12 ft

2. For a 12' dry lane
d = 0.545'
Difference in depth between Items 1 & 2
= 0.555 - 0.545 = 0.010 ft

△3 **The DPM requires that flow depth does not exceed 0.5 ft. for the ten year storm. Calculated curb height = 0.555 ft.**

Calculated flow depth = 0.555 ft.

Difference = 55/1000 ft.

Calculated flow depth is within a tolerance of 1/10 ft.

These calculations are based upon free discharge from undeveloped and developing properties (Tierra La Cueva and the Church) and "actual" discharge from existing developed sites (La Cueva High School). La Cueva High School is the only contributing site with detention ponding (controlled discharge).

△4 Wyoming Boulevard
(Double 'C' Inlet South of Q_{church})

Q_{100}
Q = 20.9 cfs
d = 0.645 ft
P = 28.645 ft
A = 7.925 sf
n = 0.017
s = 0.005

Inlet intakes 8.8 cfs
$Q_{remaining}$ = 12.1 cfs
d = 0.54 ft

12.1 cfs < 23.1 cfs = Q_{allow} for Q_{100}

Q_{10}
Q = 13.7 cfs
d = 0.563
P = 24.46 ft
A = 5.797 sf
n = 0.017
s = 0.005

Inlet intakes 7.0 cfs
$Q_{remaining}$ = 6.7 cfs
d = 0.45 ft
0.45 ft < 0.5 ft (max. curb height for Q_{10})
6.7 cfs < 13.2 cfs = Q_{allow} for Q_{10}

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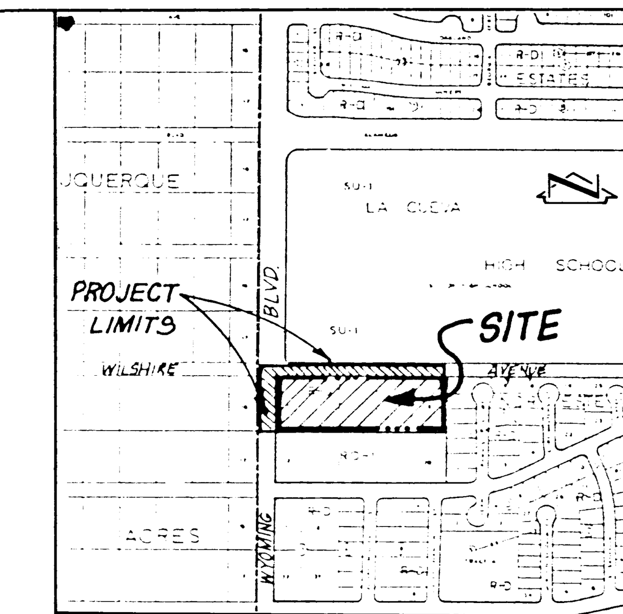


VICINITY MAP C-19
SCALE: 1"=800' (APPROX.)

AS BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

BENCH MARKS

A STANDARD A.C.S. BRASS TABLET STAMPED "1-C19 N.A.A. LOT 32, BLK 10" SET IN TOP OF A CONC. POST FLUSH W/THE GROUND, LOCATED @ THE INTERSECTION OF LOUISIANA BLVD. NE & PASEO DEL NORTE, IN THE N.E. QUADRANT, 50' NORTH OF THE N.W. CORNER OF A CHAINLINK FENCE AROUND THE F.A.A. AIR TRAFFIC CONTROL CENTER
ELEVATION: 5318.195 FT (M.S.L.D.)

SURVEY INFORMATION

FIELD NOTES		
NO.	BY	DATE

ENGINEER'S SEAL

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER
11-16-93 06-02-94
08-12-93

NO.	DATE	REMARKS	BY
△2	11/16/93	ADDED DRY DRIVING LANE CALCS	M.F.D.
△3	4/5/94	10YR STORM, FREE DISCHARGE	M.F.D.
△4	5/94	NEW WYOMING INLET CALCS	M.F.D.

REVISIONS

DESIGN		
DESIGNED BY	M.F.D.	DATE 08/93
DRAWN BY	C.E.N.	DATE 08/93
CHECKED BY	J.G.M.	DATE 08/93

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: COVENANT UNITED METHODIST CHURCH
PAVING & STORM DRAINAGE IMPROVEMENTS
DRAINAGE ANALYSIS & CALCULATIONS

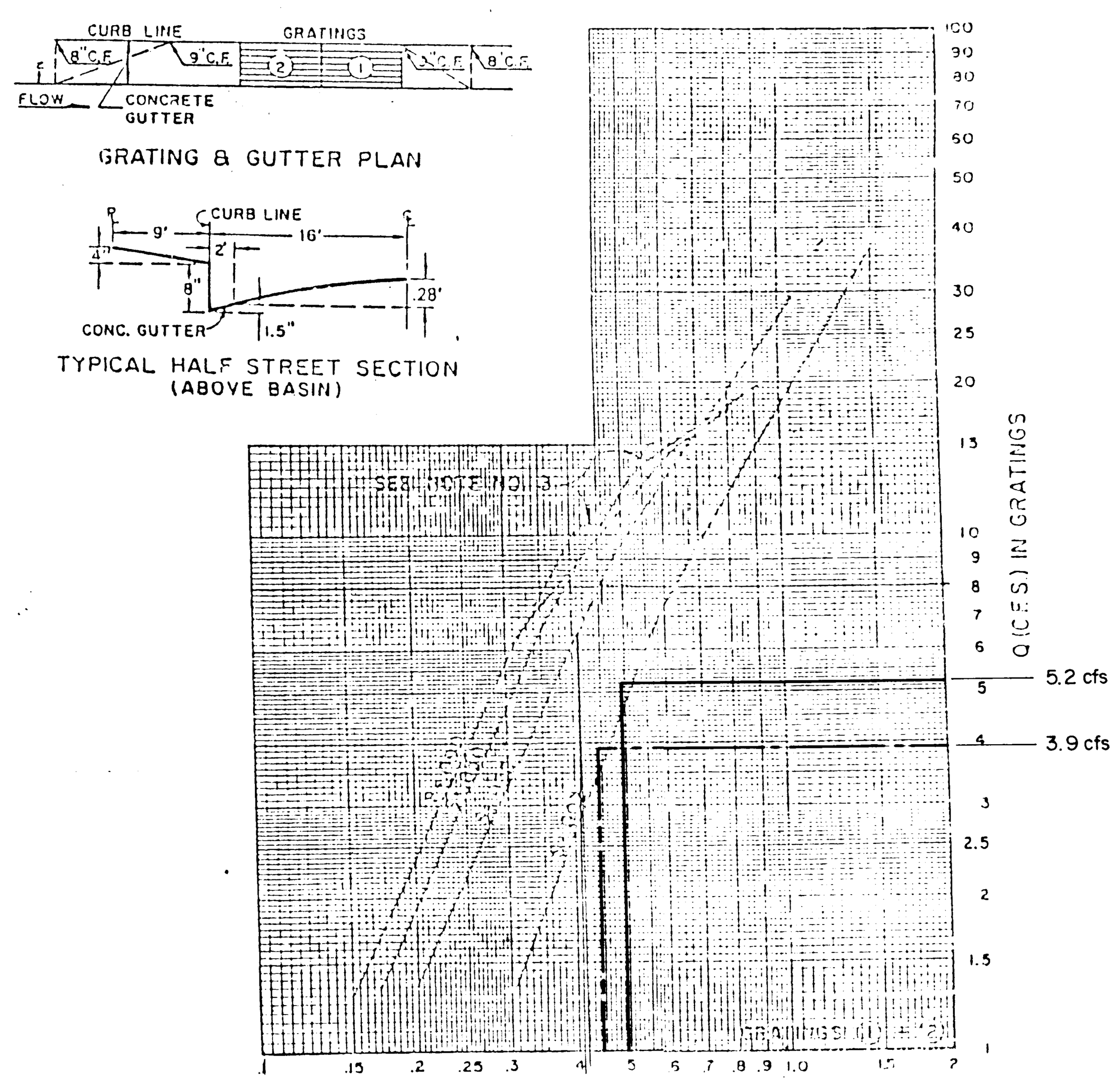
APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
JUN - 2 1994	C-19	2	6

155632

WYOMING BLVD. - DOUBLE 'C'

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



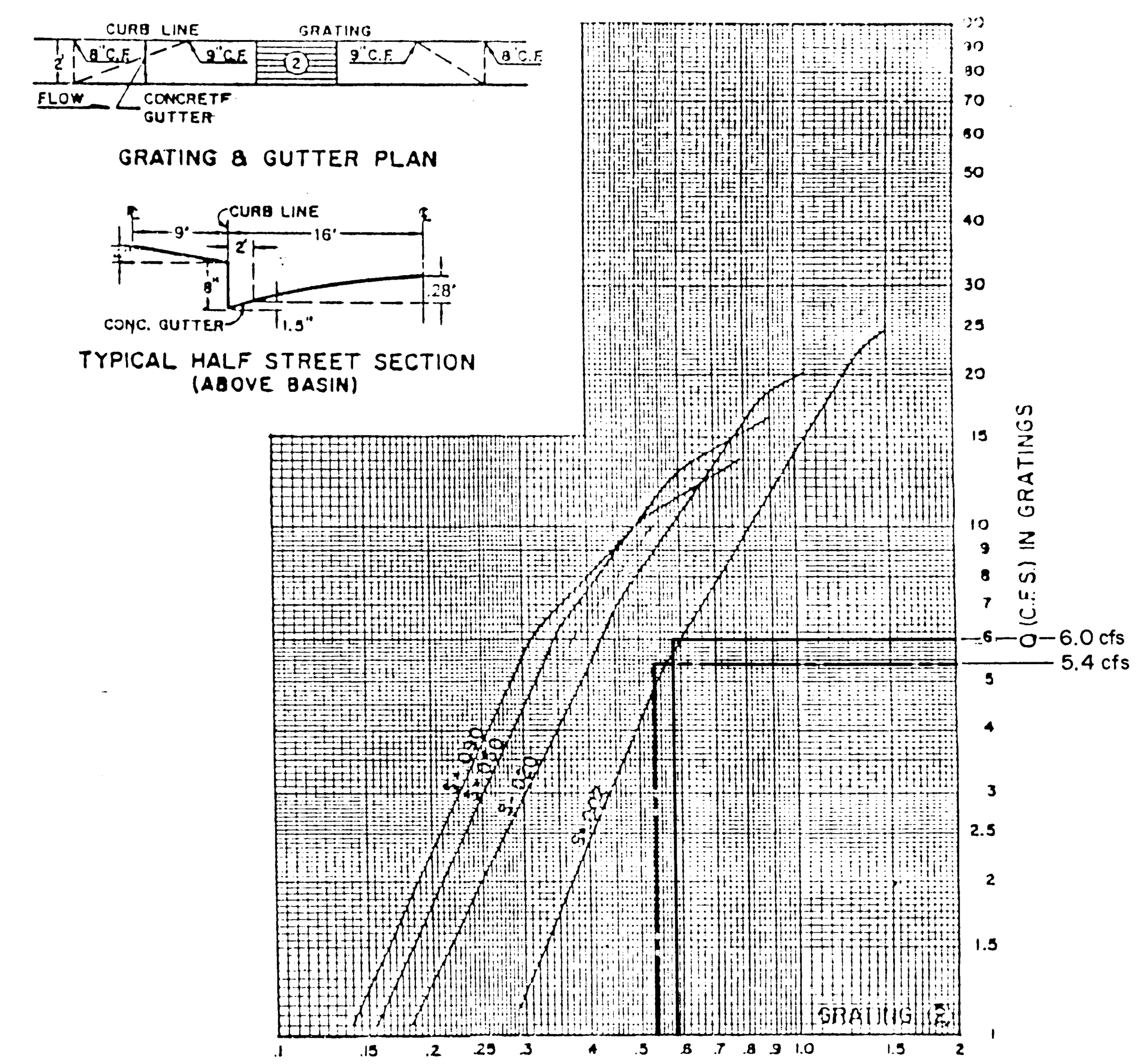
D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

Q_{100} ——— d = 0.494 FT (Q_{cap} = 5.2 cfs)

Q_{10} – – – d = 0.445 FT (Q_{cap} = 3.9 cfs)

WYOMING BLVD. - SINGLE 'A'

GRATING CAPACITIES FOR TYPE "A", "C" and "D"



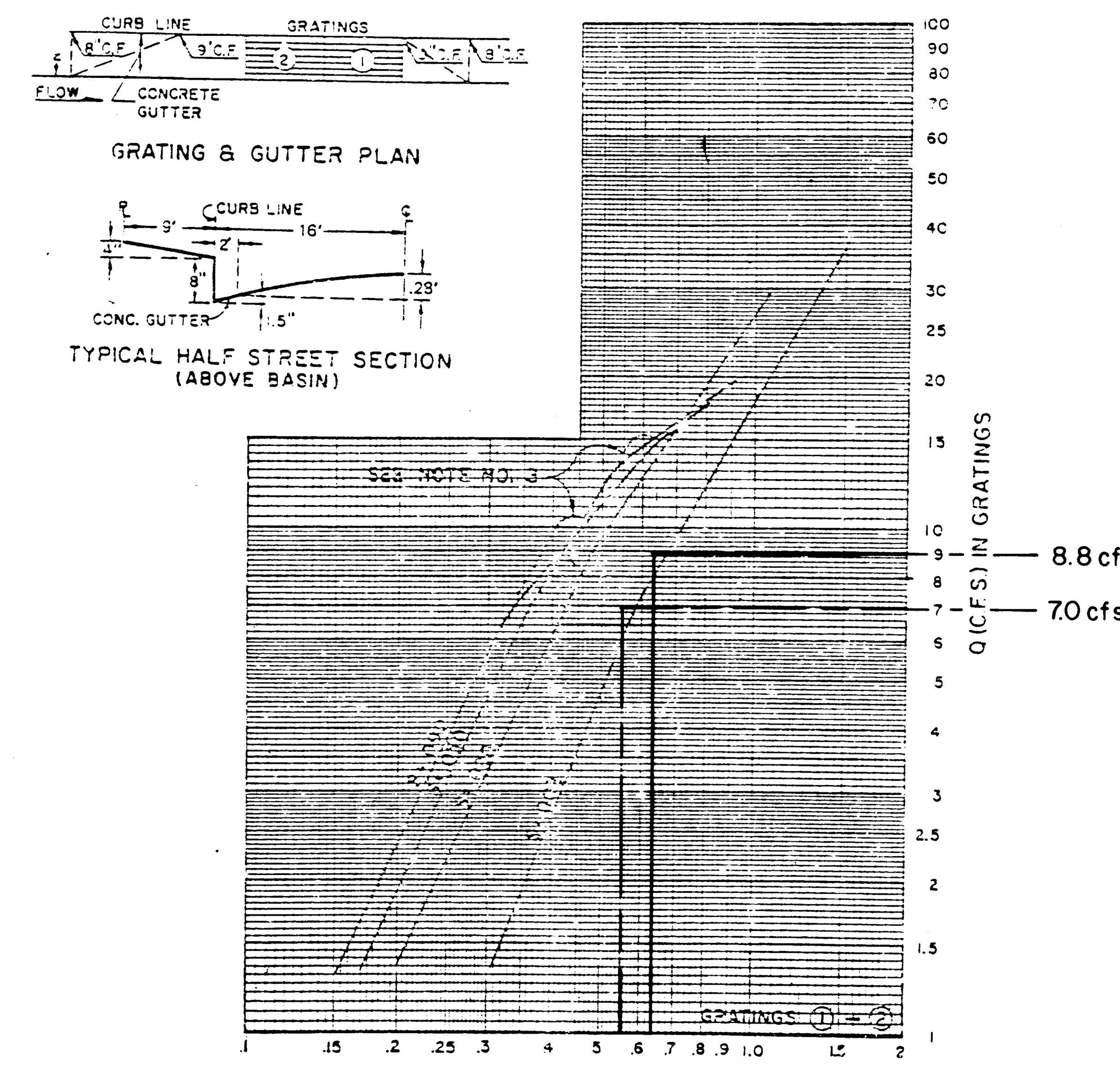
D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

Q_{100} ——— d = 0.581 FT (Q_{cap} = 6.0 cfs)

Q_{10} – – – d = 0.538 FT (Q_{cap} = 5.4 cfs)

WYOMING BLVD.-DOUBLE 'C' AFTER Q CHURCH

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



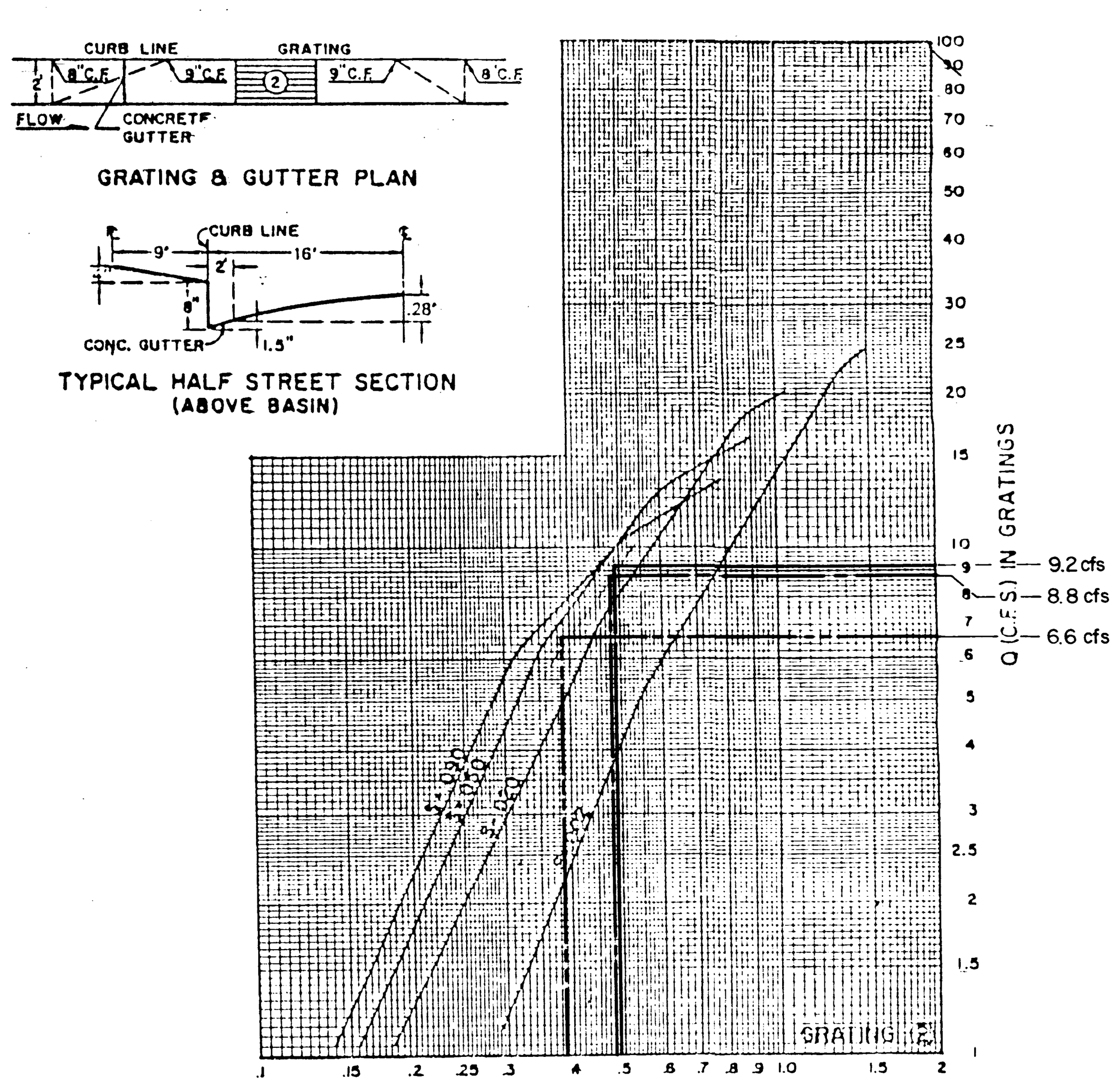
D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

Q_{100} ——— d ≐ 0.645 FT (Q_{cap} = 8.8 cfs)

Q_{10} – – – d ≐ 0.563 FT (Q_{cap} = 7.0 cfs)

WILSHIRE AVE. - SINGLE 'A'

GRATING CAPACITIES FOR TYPE "A", "C" and "D"



D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

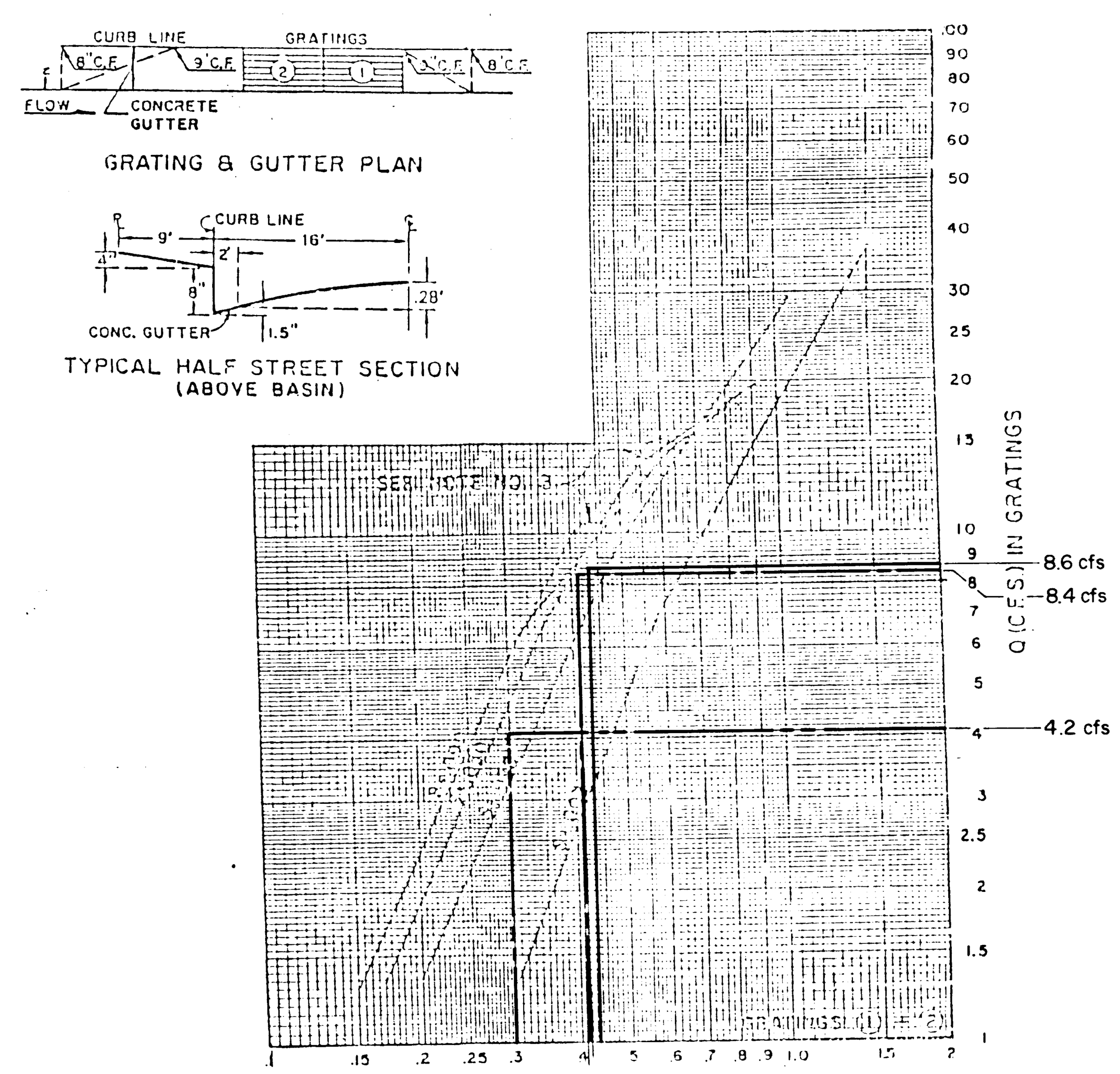
Q_{100} ——— d = 0.49 FT (Q_{cap} = 9.2 cfs)

Q_{10A} – – – d = 0.484 FT (Q_{cap} = 8.8 cfs)

Q_{10S} – – – d = 0.388 FT (Q_{cap} = 6.6 cfs)

WILSHIRE AVE. - FIRST DOUBLE 'C'

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

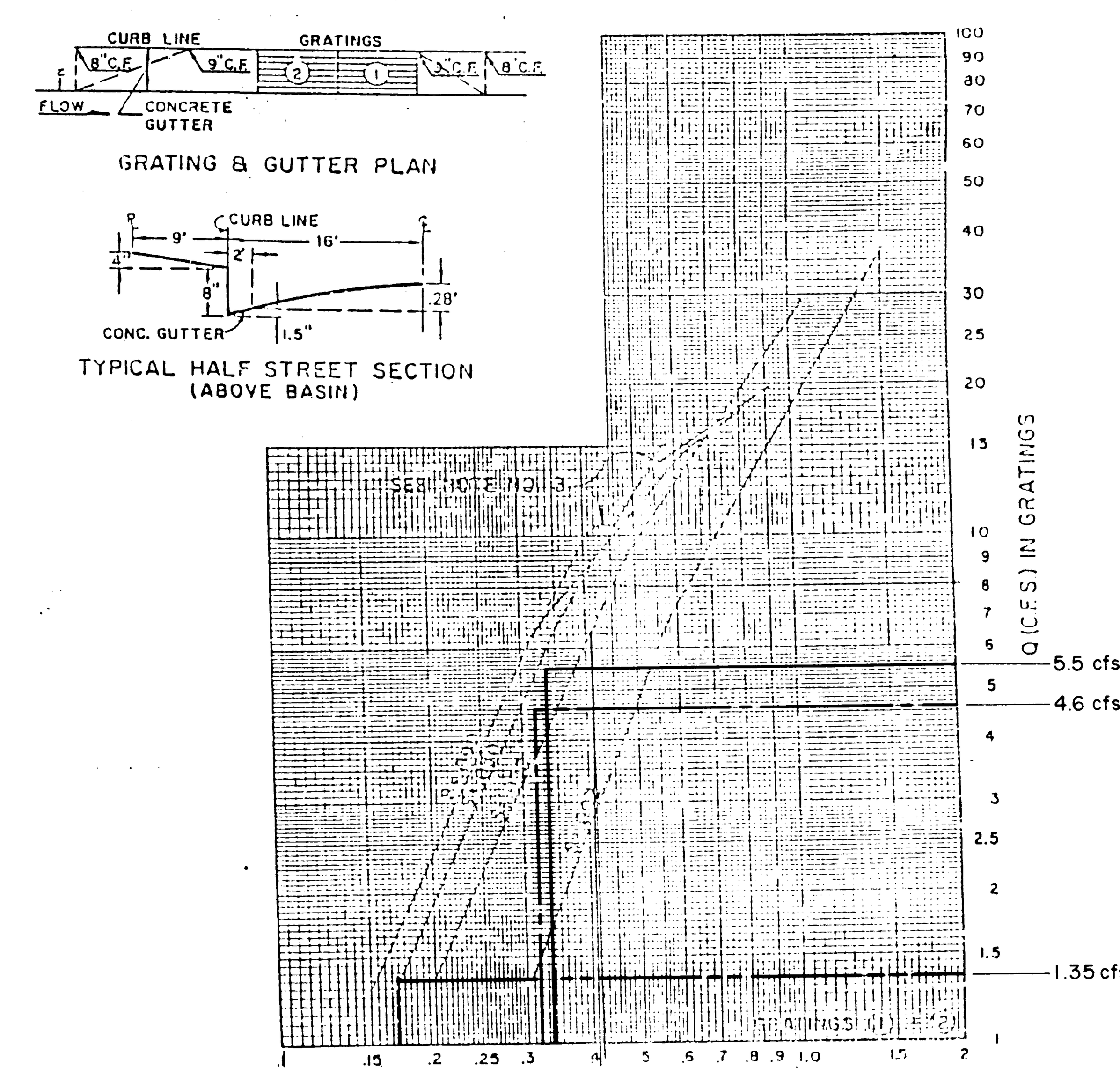
Q_{100} ——— d = 0.432 FT (Q_{cap} = 8.6 cfs)

Q_{10A} – – – d = 0.417 FT (Q_{cap} = 8.4 cfs)

Q_{10S} – – – d = 0.298 FT (Q_{cap} = 4.2 cfs)

WILSHIRE AVE. - SECOND DOUBLE 'C'

GRATING CAPACITIES FOR TYPE DOUBLE "C," AND "D"



D=DEPTH OF FLOW (FT.) ABOVE NORMAL GUTTER GRADE

Q_{100} ——— d = 0.336 FT (Q_{cap} = 5.5 cfs)

Q_{10A} – – – d = 0.319 FT (Q_{cap} = 4.6 cfs)

Q_{10S} – – – d = 0.154 FT (Q_{cap} = 1.35 cfs) (0.5 cfs NEEDED)

920412

AS BUILT INFORMATION
CONTRACTOR
WORK STAKED BY / DATE
INSPECTOR'S ACCEPTANCE BY / DATE
FIELD VERIFICATION BY / DATE
DRAWINGS CORRECTED BY / DATE

MICRO-FILM INFORMATION
RECORDED BY / DATE
NO.

BENCH MARKS
A STANDARD A.C.S. BRASS TABLET STAMPED "I-C19 N.A.A. LOT 32, BLK. 10" SET IN TOP OF A CONC. POST FLUSH W/ THE GROUND, LOCATED @ THE INTERSECTION OF LOUISIANA BLVD. NE & PASEO DEL NORTE, IN THE N.E. QUADRANT, 50' NORTH OF THE N.W. CORNER OF A CHAINLINK FENCE AROUND THE F.A.A. AIR TRAFFIC CONTROL CENTER
ELEVATION: 5318.175 FT. (M.S.L.D.)

SURVEY INFORMATION
FIELD NOTES
NO. / BY / DATE

ENGINEER'S SEAL
JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER
08-12-93

NO.	DATE	REMARKS	BY
3	5/94	INLET TABLE	M.F.D.

REVISIONS

DESIGN			
DESIGNED BY	M.F.D.	DATE	08/93
DRAWN BY	C.E.N.	DATE	08/93
CHECKED BY	J.G.M.	DATE	08/93

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

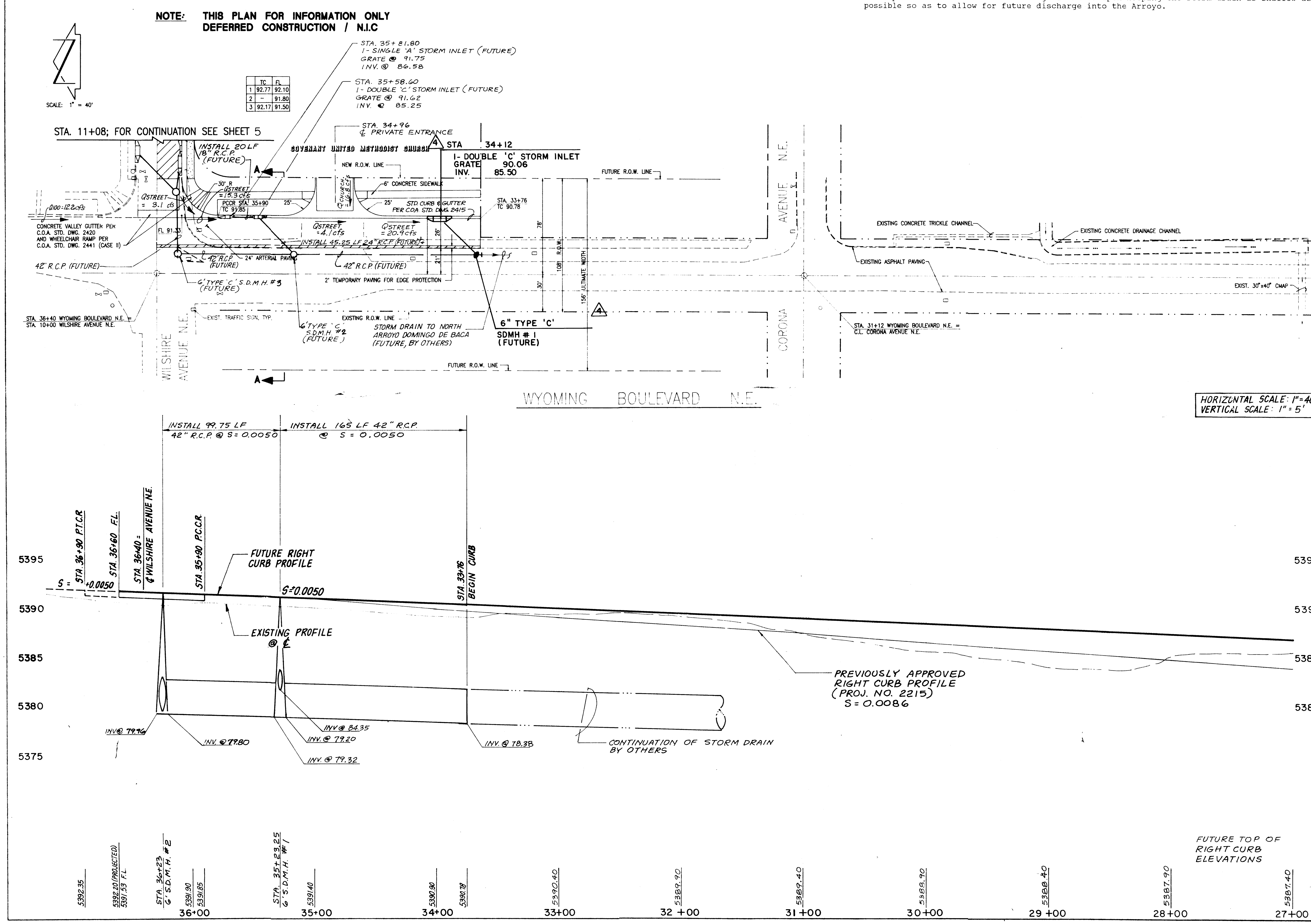
TITLE: COVENANT UNITED METHODIST CHURCH
PAVING & STORM DRAINAGE IMPROVEMENTS
GRATING CAPACITIES

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
- 2994	C-19	3	6

DESIGN ANALYSIS

The street grades presented hereon have been established at the minimum allowable street grade set forth in the Development Process Manual. The minimum slope of 0.0050 has been maintained. The previously approved street grade for this portion of Wyoming Boulevard N.E. is 0.0086 which would place the street profile lower than that which is proposed at this time. The gradient of 0.0050 has been selected due to the fact that it is a minimum slope and that it provides of the highest possible street grade at the crossing of the North Arroyo de Domingo Baca, this will provide more flexibility in discharging into that Arroyo once a crossing is designed at a future date. The storm drain shown hereon has been established at the same minimum street grade of 0.0050. The design assumption here is that the storm drain shall parallel the street. The design is based upon keeping the storm drain as shallow as possible so as to allow for future discharge into the Arroyo.



920412

A STANDARD A.C.S. BRASS TABLET STAMPED "I-C19 N.A.A. LOT 32, BLK. 10" SET IN TOP OF A CONC. POST FLUSH WITH THE GROUND, LOCATED @ THE INTERSECTION OF LOUISIANA BLVD. NE & LOS ANGELES DRIVE NE IN THE NORTHEAST QUADRANT, 50' NORTH OF THE NORTHWEST CORNER OF A CHAINLINK FENCE AROUND THE FAA AIR TRAFFIC CONTROL CENTER. ELEVATION : 5318.195 FEET (M.S.L.D.)

NO	DATE	REMARKS
4	5/94	NEW INLET & MH

REVISIONS

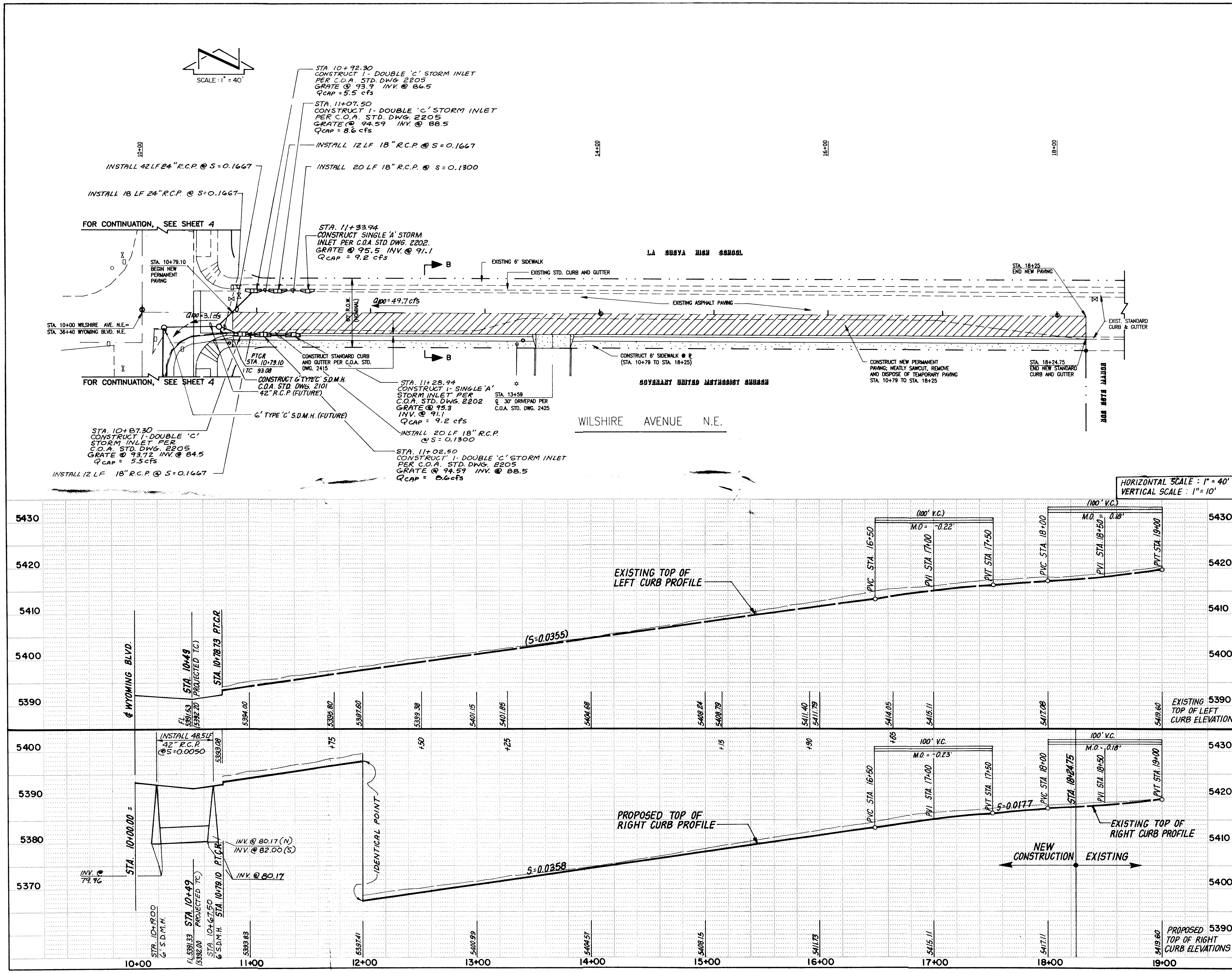
		DATE
DESIGNED BY	J.G.M.	06/93
DRAWN BY	S.G.H. / T.P.H.	06/93
CHECKED BY	J.G.M.	07/93

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: COVENANT UNITED METHODIST CHURCH
PAVING & STORM DRAINAGE IMPROVEMENTS
WYOMING BLVD. N.E.~ STA. 31+12 TO STA. 36+40

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
	C-19	4	6



920412

STREET PAVING IMPROVEMENTS

1. ALL SLOPES AS SHOWN ON PROFILES ARE BASED ON CENTERLINE STATIONING UNLESS OTHERWISE NOTED.

2. WHERE REMOVAL OF EXISTING CURB AND GUTTER, SIDEWALK OR PAVEMENT IS REQUIRED, THE CONTRACTOR SHALL SAWCUT AND/OR REMOVE TO THE NEAREST JOINT. CURB AND GUTTER SHOWN AS EXISTING AND NOT TO BE REMOVED UNDER THIS CONTRACT WHICH IS DAMAGED OR DISPLACED BY THE CONTRACTOR SHALL BE REMOVED AND REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.

3. ALL DIMENSIONS OF CURB AND CURB RETURNS ARE SHOWN TO FACE OF CURB.

AS BUILT INFORMATION

CONTRACTOR | DATE
WORK STAKED BY / INSPECTOR'S ACCEPTANCE BY | DATE
FIELD VERIFICATION BY / DRAWINGS CORRECTED BY | DATE
MICRO-FILM INFORMATION
RECORDED BY | DATE
NO.

BENCH MARKS

A STANDARD A.C.S. BRASS TABLET STAMPED "1-C19 N.A.A. LOT 32, BLK. 10 SET IN TOP OF A CONC. POST FLUSH WITH THE GROUND. LOCATED @ THE INTERSECTION OF LOUISIANA BLVD. N.E. & LOS ANGELES DRIVE N.E. IN THE NORTHEAST QUADRANT, 50 NORTH OF THE NORTHWEST CORNER OF A CHAINLINK FENCE AROUND THE F.A.A. AIR TRAFFIC CONTROL CENTER.
ELEVATION : 5318.195 FEET (M.S.L.D)

SURVEY INFORMATION

NO.	FIELD NOTES BY	DATE

ENGINEER'S SEAL

JEFFREY G. MORTENSEN, NEW MEXICO, 8547, REGISTERED PROFESSIONAL ENGINEER

06-02-94
08-12-93
07-02-93

NO.	DATE	REMARKS	BY

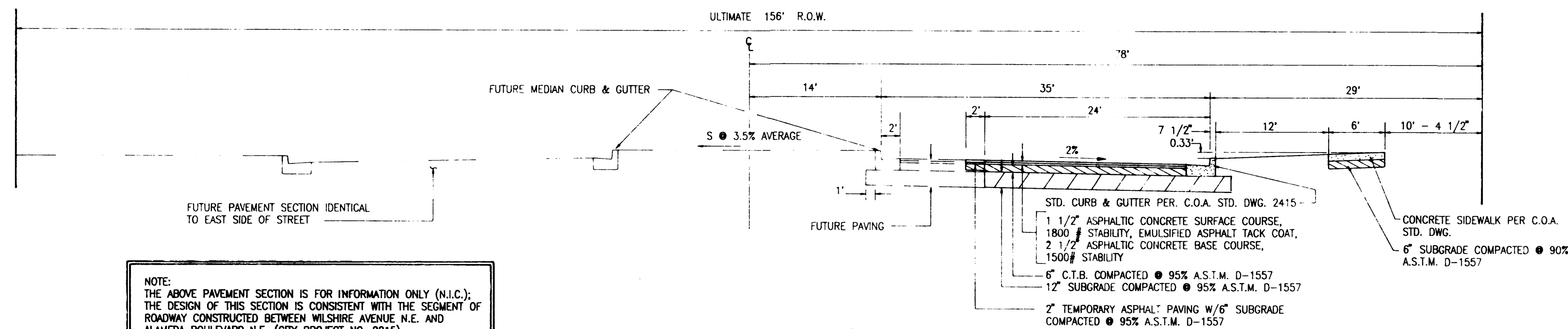
REVISIONS		
DESIGN		
DESIGNED BY J.G.M.	DATE	06/93
DRAWN BY S.G.H./T.P.H.	DATE	06/93
CHECKED BY J.G.M.	DATE	07/93

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: COVENANT UNITED METHODIST CHURCH
PAVING & STORM DRAINAGE IMPROVEMENTS
WILSHIRE AVE. N.E.~STA. 10+00 TO STA. 18+24.75

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPORTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
JUN - 2 1994	C-19	5	6

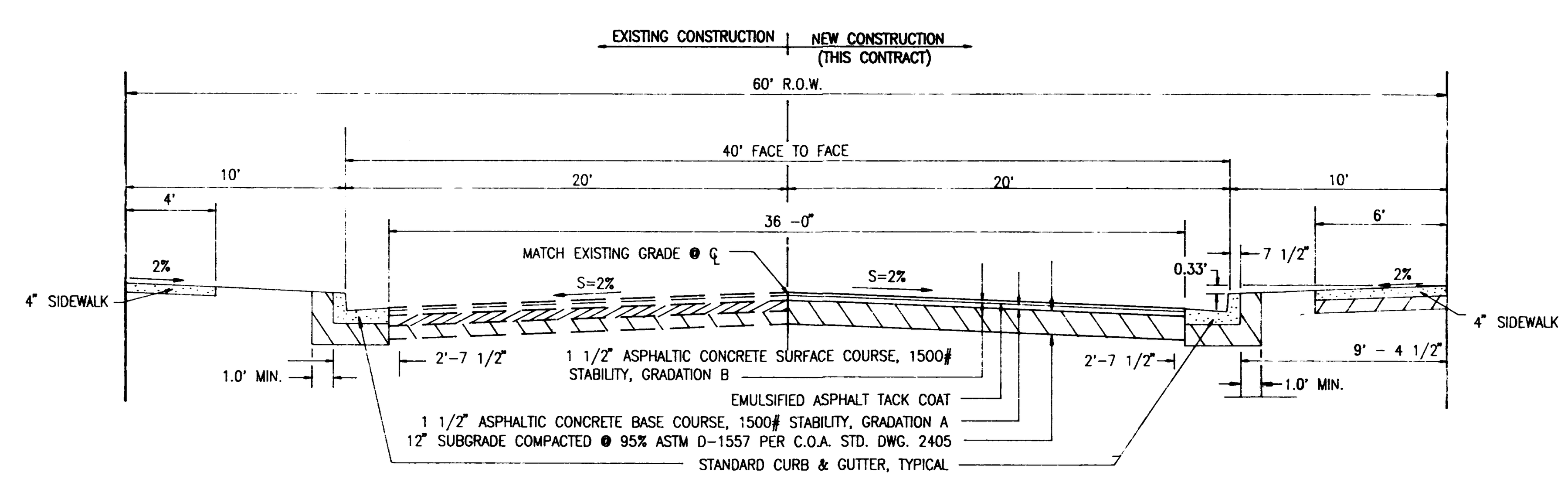


NOTE:
THE ABOVE PAVEMENT SECTION IS FOR INFORMATION ONLY (N.I.C.); THE DESIGN OF THIS SECTION IS CONSISTENT WITH THE SEGMENT OF ROADWAY CONSTRUCTED BETWEEN WILSHIRE AVENUE N.E. AND ALAMEDA BOULEVARD N.E. (CITY PROJECT NO. 2215)

SECTION A – A

SCALE: 1" = 10' HORIZONTAL
1" = 6' VERTICAL

(WYOMING)



SECTION B – B

SCALE: 1" = 6'

(WILSHIRE)

920412

AS BUILT INFORMATION

CONTRACTOR	
WORK STAKED BY	DATE
INSPECTOR'S ACCEPTANCE BY	DATE
FIELD VERIFICATION BY	DATE
DRAWINGS CORRECTED BY	DATE

MICRO-FILM INFORMATION

RECORDED BY	DATE
NO.	

BENCH MARKS

A STANDARD A.C.S. BRASS TABLET, STAMPED "1–C19 N.A.A. LOT 32, BLK 10", SET IN TOP OF A CONCRETE POST FLUSH WITH THE GROUND LOCATED AT THE INTERSECTION OF LOUISIANA BOULEVARD N.E. AND LOS ANGELES DRIVE N.E., IN THE NORTHEAST QUADRANT, 50' NORTH OF THE NORTHWEST CORNER OF A CHAINLINK FENCE AROUND THE F.A.A. AIR TRAFFIC CONTROL CENTER.
ELEVATION = 5318.195 FEET (M.S.L.D.)

SURVEY INFORMATION

FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL

JEFFREY G. MORTENSEN
NEW MEXICO
8547
REGISTERED PROFESSIONAL ENGINEER

06-02-93
07-02-93

NO.	DATE	REMARKS	BY
		REVISIONS	

DESIGN		
DESIGNED BY	J.G.M.	DATE 06-93
DRAWN BY	S.G.H.	DATE 06-93
CHECKED BY	J.G.M.	DATE 06-93

CITY OF ALBUQUERQUE
PUBLIC WORKS DEPARTMENT
ENGINEERING GROUP

TITLE: **COVENANT UNITED METHODIST CHURCH**
SECTIONS AND DETAILS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
DRC CHAIRMAN			WATER		
TRANSPROTATION			WASTE WATER		
HYDROLOGY					

PROJECT NO.	MAP NO.	SHEET	OF
- 2 1994	C-19	6	6