MEGSON, HEAGLE & FRIEND

CIVIL ENGINEERS & LAND SURVEYORS, LLC
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033
PHONE (860) 659-0587
FAX (860) 657-4429

HYDROLOGY AND HYDRAULICS & NITROGEN LOADING ENGINEERING REPORT

GENERAL LANDSCAPING, LLC
121 KREIGER LAND, GLASTONBURY, CT

January 13, 2022

Prepared By:

Mark W. Friend, PE
Soil Scientist, LEED AP

TABLE OF CONTENTS

Summary

In general, the project is a proposed 15 space paved parking lot and landscape materials storage area on 121 Kreiger Lane. It is intended to be an extension of the existing operation General Landscaping, LLC currently operates at 100 and 116 Kreiger Lane directly across the street. The paved area is proposed to be drained via both inlet and pipe system as well as sheet flow to the south and into a stormwater management basin (SWMB).

This basin will treat the water quality volume and dissipate it into a coarse aggregate layer of bedding material. Underlying soil conditions, as evidenced by a test deep pit, indicate coarse grained soils as well as a deep groundwater table. This will allow storage and infiltration of the water quality volume as well as reduce increases in peak flows from the 2 to 100 years storms.

Methodology

Peak flows were developed using the Rational Method. These were used to analyze the capacity of the existing town drainage system serving Kreiger Lane to ensure adequacy for a 10 year return frequency storm. This system was designed, with the original subdivision, in anticipation of full development of all the industrial lots fronting on the street. The Point Precipitation Frequency Estimates were taken from NOAA Atlas 14, Volume 10, Version 3 as developed for the Town of Glastonbury. The drainage areas to each catch basin are shown on the Drainage Area Map in the appendices. The Water Quality Volume was computed using the equation in the 2004 Connecticut Stormwater Quality Manual.

Required Water Quality Volume

$WQV = \frac{(1")(R)(A)}{12}$ Where

$R = 0.05 + 0.009(I)$ $0.05 + 0.009(70) = 0.680$

$I = \%\ \text{Impervious} = \frac{27{,}878\ \text{S.F.}}{40{,}073\ \text{S.F.}} = 70\%$

A = area of the catchment = 0.92 AC

$WQV = \frac{(1")(0.680)(0.92)}{12} = 0.052\ \text{AC-FT} =$ **2,271 CF**

WQV provided – 4,671 CF > 2,271 CF

Conclusions

- The existing Town drainage system will adequately convey a 10 year return frequency storm without surcharge in accordance with the Town of Glastonbury Engineering Department requirements. This is consistent with the original design of the Kreiger Lane drainage system which anticipated full development of the industrial lots
- The proposed SWMB will provide a storage capacity in excess of 200% of the Water Quality Volume (WQV) which is 2,271 CF.
- No adverse impacts from development will be created for downstream areas.
- The Water Quality Volumes from the project will be collected and infiltrated within the SWMB proposed.
- The proposed Stormwater Management Measures exceed the goals of the 2004 Connecticut Stormwater Quality Manual.

APPENDIX A
HYDRAULIC GRADE LINE (HGL) CALCULATIONS

Storm Sewer Summary Report

Line No.	Line ID	Flow rate (cfs)	Line size (in)	Line length (ft)	Invert EL Dn (ft)	Invert EL Up (ft)	Line slope (%)	HGL down (ft)	HGL up (ft)	Minor loss (ft)	HGL Junct (ft)	Dns line No.
1	FLEND TO 19+25	39.70	42 c	48.0	80.96	81.21	0.521	83.00	83.22	0.38	83.59	End
2	19+25 TO 17+50	37.50	30 c	172.0	82.05	90.56	4.948	84.10	92.61	n/a	92.61 j	1
3	17+50 TO 16+33	35.80	30 c	110.0	90.56	92.27	1.555	92.96	94.27	n/a	94.27 j	2

Project File: New.stm | Number of lines: 3 | Run Date: 01-13-2022

NOTES: c = cir; e = ellip; b = box; Known Qs only ; j - Line contains hyd. jump.

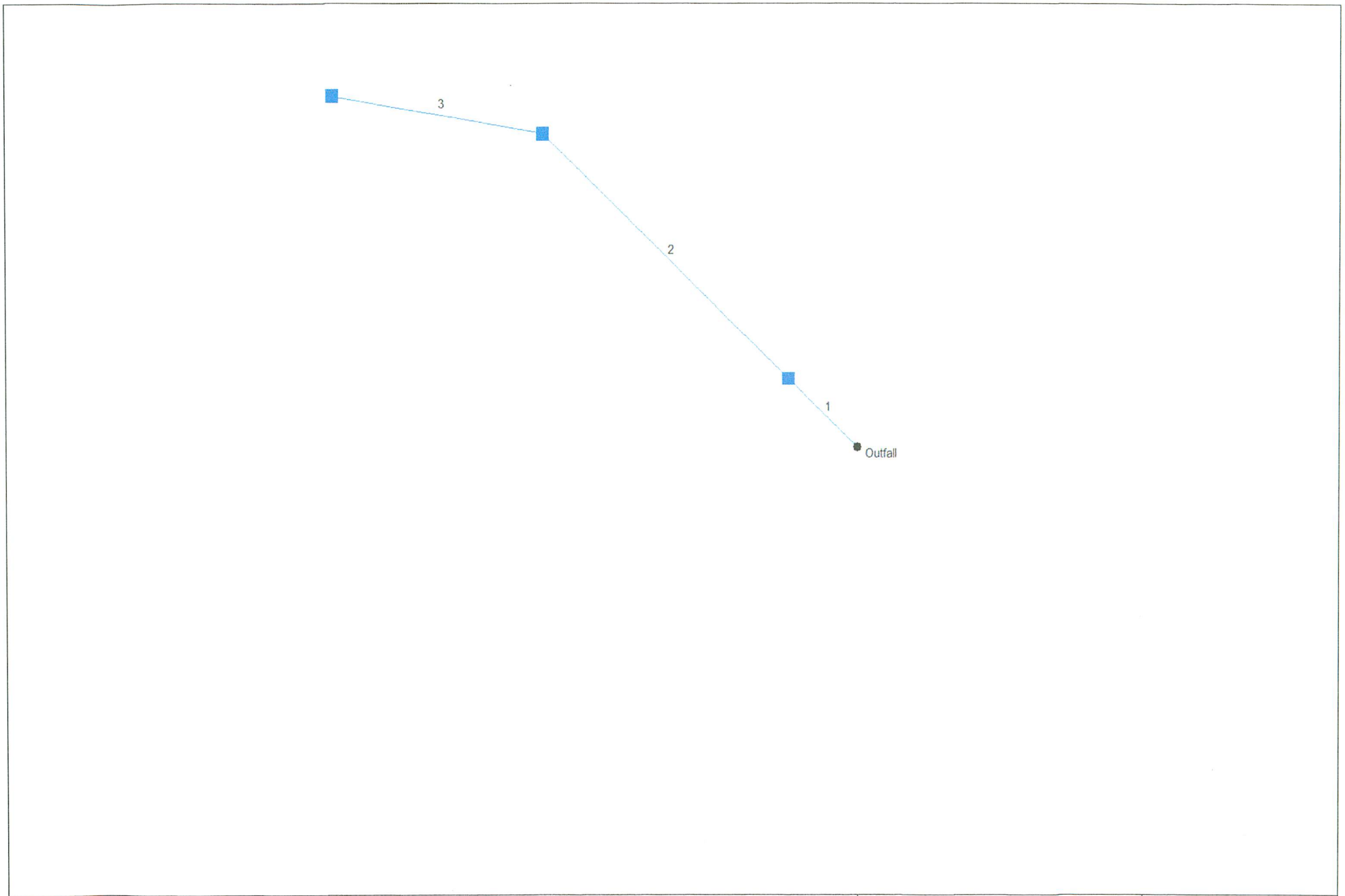
Hydraulic Grade Line Computations

Line	Size	Q	Downstream								Len	Upstream								Check		JL coeff	Minor loss
			Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf		Invert elev	HGL elev	Depth	Area	Vel	Vel head	EGL elev	Sf	Ave Sf	Enrgy loss		
	(in)	(cfs)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(ft)	(ft)	(ft)	(ft)	(sqft)	(ft/s)	(ft)	(ft)	(%)	(%)	(ft)	(K)	(ft)
1	42	39.70	80.96	83.00	2.04	5.82	6.82	0.72	83.72	0.502	48.0	81.21	83.22	2.01	5.71	6.95	0.75	83.97	0.528	0.515	0.247	0.50	0.38
2	30	37.50	82.05	84.10	2.05*	4.30	8.72	1.18	85.28	1.115	172	90.56	92.61 j	2.05**	4.30	8.72	1.18	93.79	1.115	1.115	n/a	0.90	n/a
3	30	35.80	90.56	92.96	2.40	4.84	7.39	0.85	93.81	0.884	110	92.27	94.27 j	2.00**	4.21	8.51	1.12	95.39	1.062	0.973	n/a	1.00	n/a

Project File: New.stm | Number of lines: 3 | Run Date: 01-13-2022

Notes: * Critical depth assumed.; ** Critical depth.; j-Line contains hyd. jump.

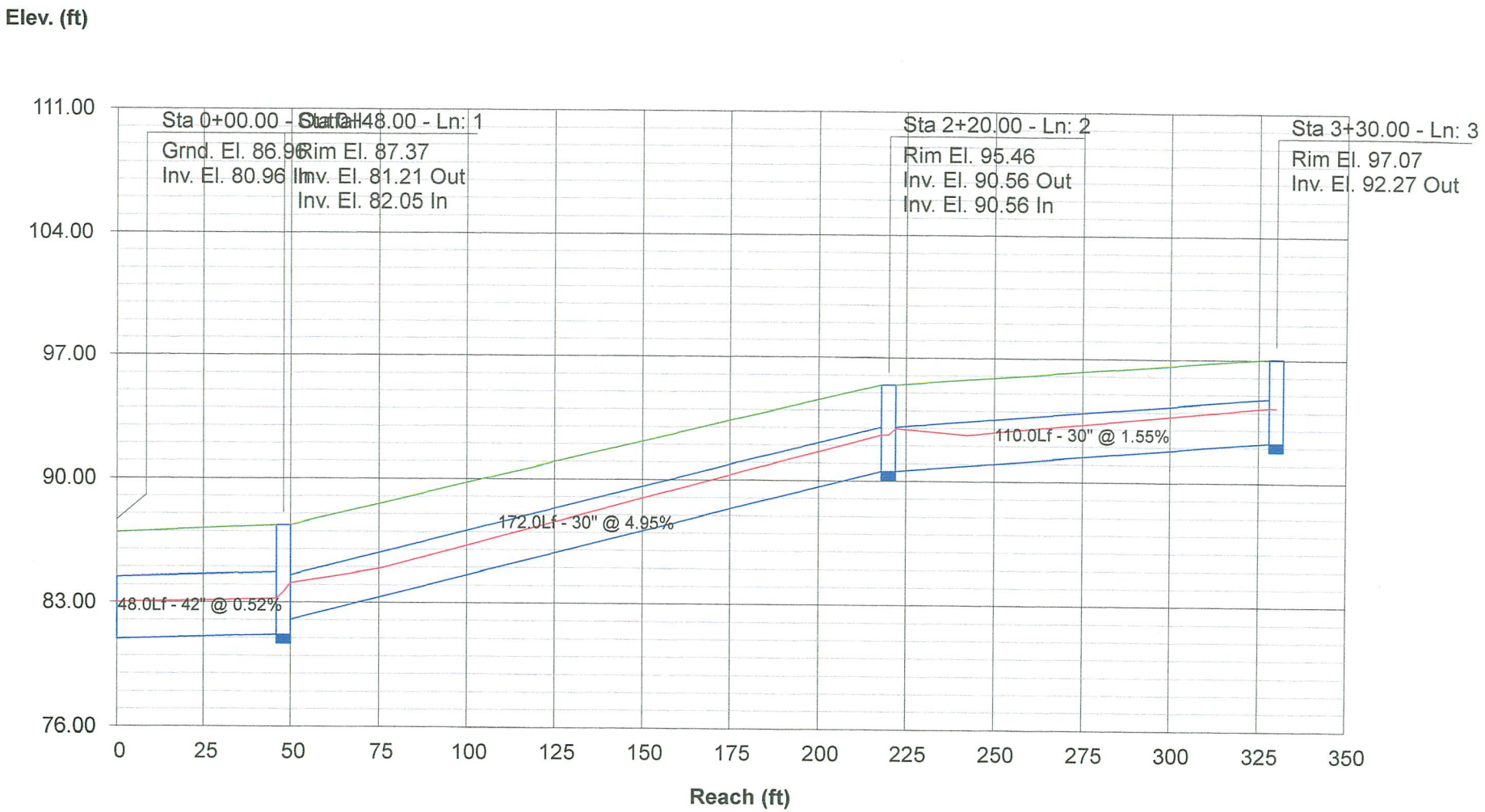
Hydraflow Plan View



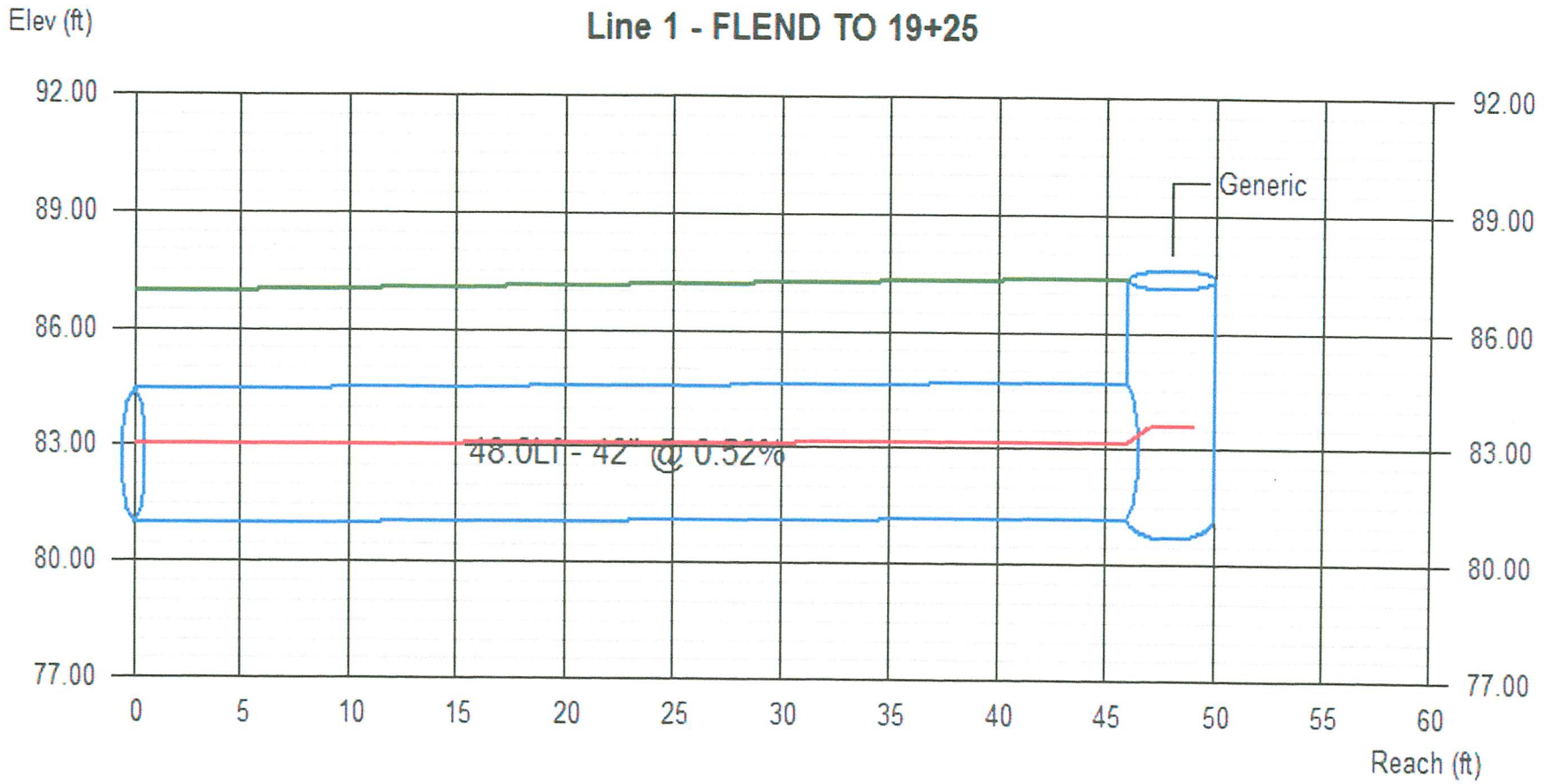
Project File: New.stm	No. Lines: 3	01-13-2022

Storm Sewer Profile

Proj. file: New.stm



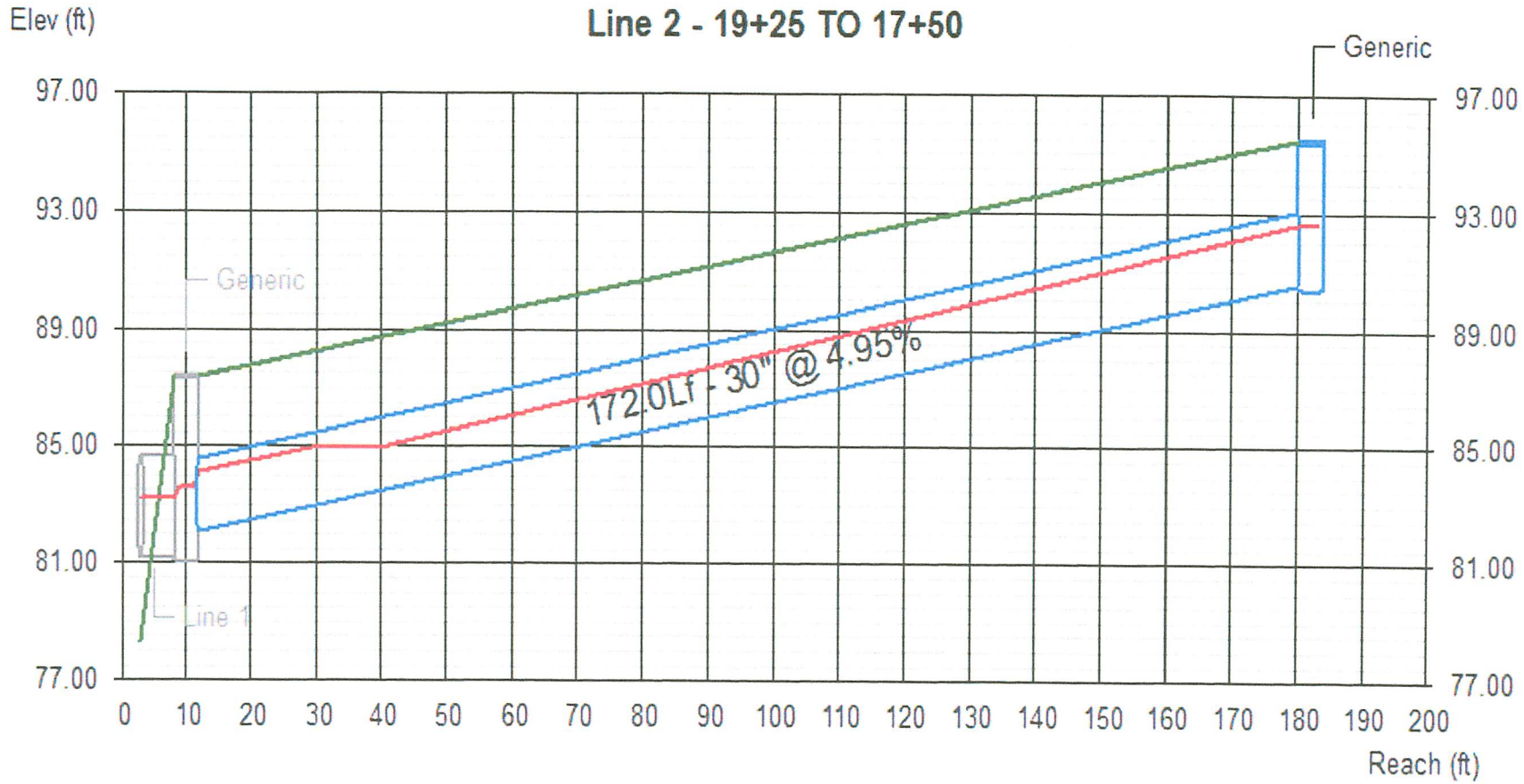
Line Profile (Line 1) - FLEND TO 19+25



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
1	39.70	80.96	81.21	2.04	2.01	2.38	83.00	83.22	83.59	6.82	6.95	2.50	2.66

Project File: | No. Lines: 3 | Run Date: 01-13-2022

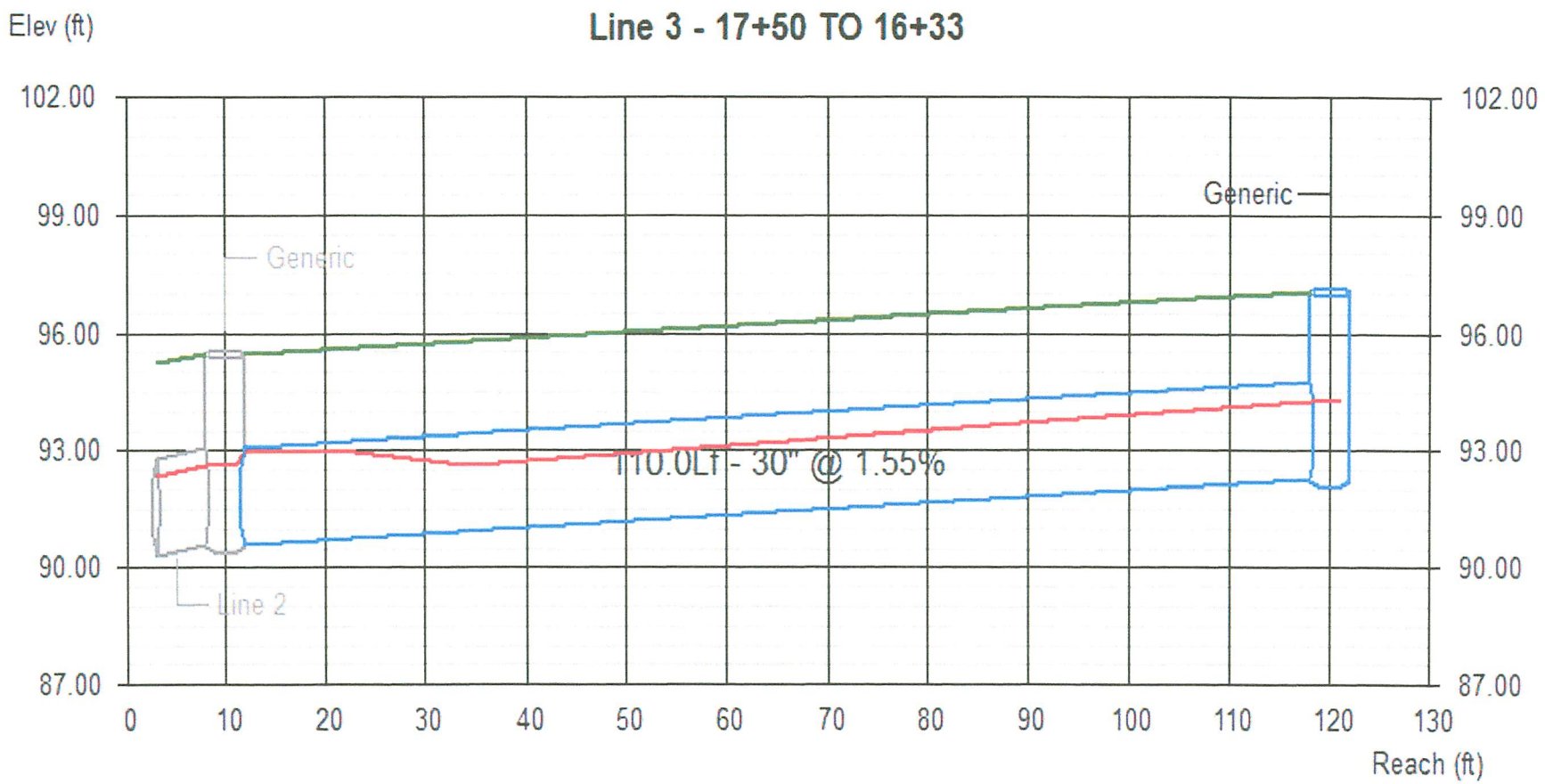
Line Profile (Line 2) - 19+25 TO 17+50



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
2	37.50	82.05	90.56	2.05	2.05	2.05	84.10	92.61 j	92.61	8.72	8.72	2.82	2.40

Project File: | No. Lines: 3 | Run Date: 01-13-2022

Line Profile (Line 3) - 17+50 TO 16+33



Line #	Q	Invert Elevation		Depth of Flow			Hydraulic Grade Line			Velocity		Cover	
	(cfs)	Dn (ft)	Up (ft)	Dn (ft)	Up (ft)	Hw (ft)	Dn (ft)	Up (ft)	Jnct (ft)	Dn (ft/s)	Up (ft/s)	Dn (ft)	Up (ft)
3	35.80	90.56	92.27	2.40	2.00	2.00	92.96	94.27 j	94.27	7.39	8.51	2.40	2.30

Project File: | No. Lines: 3 | Run Date: 01-13-2022

APPENDIX B
DRAINAGE AREAS &
STORM SEWER DESIGN SHEET

MEGSON, HEAGLE & FRIEND
Civil Engineers & Land Surveyors, LLC
81 Rankin Road
Glastonbury, Connecticut 06033
(860) 659-0587

JOB 131-20 GENERAL LANDSCAPE
SHEET NO. _____ OF _____
CALCULATED BY MWF DATE 1-12-22
CHECKED BY _____ DATE _____
SCALE _____

RUNOFF TO CB STA 16+33

AREA - 9.15 AC IMPERVIOUS 4.87 AC PERVIOUS

$$\text{WEIGHTED } C_{IMP} = \frac{(9.15)(0.9)+(4.87)(0.3)}{14.02 \text{ AC}} = 0.69$$

T_c = 20 MIN (FROM ORIGINAL DRAINAGE REPORT)

I = 3.7 (NOAA ATLAS 14, VOL 10, V.3)

AI = (14.02)(0.69) = 9.67

RUNOFF TO CB STA 17+50

AREA - 9.60 AC IMPERVIOUS 5.10 AC PERVIOUS

$$\text{WEIGHTED } C_{IMP} = \frac{(9.60)(0.9)+(5.10)(0.3)}{14.70 \text{ AC}} = 0.69$$

T_c = 20 MIN

I = 3.7

AI = (14.70)(0.69) = 10.14

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(860) 659-0587

JOB 131-20 GENERAL LANDSCAPE

SHEET NO. _____ OF _____

CALCULATED BY MWF DATE 1-12-22

CHECKED BY _____ DATE _____

SCALE _____

RUNOFF TO CB STA 19+25

AREA - 10.35 AC IMPERVIOUS 5.89 AC PERVIOUS

$$\text{WEIGHTED } C_{IMP} = \frac{(10.35)(0.9) + (5.89)(0.3)}{16.24 \text{ AC}}$$

$$= 0.68$$

$T_c = 21$ MIN

$I = 3.6$

$A1 = (16.24)(0.68) = 11.04$

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS, LLC
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GLASTONBURY, CONN. 06033
PHONE: (860) 659-0587

Project 131-20 GENERAL LANDSCAPE Designed by MWF Date 1-12-22

Town GLASTONBURY Checked by Date

Sheet No. of

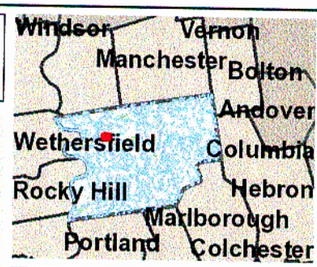
Storm Sewer System Design

"n"	15	.015	"	"																					
Headwater	14																								
Full Capacity	13	45	80	40																					
Average Velocity	12	-	-	-																					
Slope	11	1.6	5.0	0.5																					
Length of Pipe	10	110'	172'	48'																					
Pipe Size	9	30"	30"	42"																					
Q in System	8	35.8	37.5	39.7																					
Rainfall Intensity	7	3.7	3.7	3.6																					
Sum of AI in System	6	9.67	10.14	11.04																					
AI Entering CB	5	9.67	0.47	0.90																					
Accumulated Time	4	20	20	21																					
Time in Pipe	3	-	-	-																					
Time to Inlet	2	20	20	21																					
Line Segment	1	CB STA 16+23 TO STA 17+50	CB STA 17+50 TO CB STA 19+25	CB STA 19+25 TO END																					

APPENDIX C
DRAINAGE AREAS MAP

Town of Glastonbury GIS

Town of Glastonbury



LOT 8
129

LOT 9
133

LOT 7
121

1.66 I
.74 P

LOT 6
105

.64 I
.27 P

LOT 5
91

.64 I
.28 P
(ASSUMED)

.64 I
.28 P
(ASSUMED)

LOT 4
77

LOT 3
65

.64 I
.28 P

1.53 I
.80 P

23

51

18"

15"

KREIGER LANE

.25 I
.15 P

LOT 10
126

.43 I
.47 P

.59 I
.31 P

.47 I
.45 P

LOT 13
90

.65 I
.28 P

(ASSUMED) .64 I .28 P

LOT 15
58

LOT 14
74

LOT 12

LOT 11
116

100 Unit A A
100 Unit B B
100 Unit C C
100 Unit D D
100 Unit E E
100 Unit F F
100 Unit G G
100 Unit H H

.75 I
.79 P

1-13-20
GENERAL LANDSCAPE
131-20
DRAINAGE
AREAS

4000

Legend

- Property Line
- Address Points
- Sanitary Pump Stations
- Sanitary Manhole
  - Active, Gravity
  - Active, Pressure
  - Capped, Gravity
- Sanitary Gravity Main
  - Active, 6" - 8"
  - Active, 10" - 18"
  - Active, 24" - 36"
  - Capped, 8"
- Sanitary Force Main
  - 2" - 4"
  - 10" - 18"
- Storm Inlet Structures
  - Catch Basin
  - Flared End
  - Headwall
  - Overflow
  - Pipe End
  - Yard Drain
- Storm Outlet Structures
  - End Wall
  - Flared End
  - Pipe End
- Storm Manhole
- Storm Gravity Lines
  - Culvert, 42" - Larger
  - Culvert, 15" - 36"
  - Collector, 64" - 84"
  - Collector, 30" - 48"
  - Collector, 18" - 27"
  - Collector, 1" - 15"
- Storm Open Channel
- Storm Gravity Lines - (Abandoned)
- Storm Detention Ponds
- Dams
- Glastonbury Fire Hydrants
- Manchester Fire Hydrants
- MDC Fire Hydrants
- Sewer Easement
- Drainage Easement
- Street Centerlines
  - State Highway
  - Secondary Roads
- Utility Poles, Towers and Lights
  - Utility poles without street light
  - Utility pole with street light
  - Light Pole
  - Transmission or Cellphone Tower
  - Electric Box for traffic signals
- Buildings
  - Building
  - Out building
  - Area under constuction
  - Building foundation
  - Mobile home, trailer
  - Ruined building or structure
- Ancillary Structures
  - Solar Panels on ground
  - Smokestack
  - Water storage tank
  - Dam Structure
  - Bus Shelter
  - Deck
  - Flight of Stairs
  - Fuel storage tank
  - Generator
  - Miscellaneous Structure
  - Miscellaneous tank
  - Porch
  - Swimming pool above ground
  - Swimming pool inground

1: 1,200

200 0 100 200 Feet

NAD_1983_StatePlane_Connecticut_FIPS_0600_Feet

Notes

Enter Map Description

APPENDIX D
STORMWATER MANAGEMENT BASIN VOLUME CALCULATIONS

Volume of Pond

MEGSON, HEAGLE & FRIEND
Civil Engineers & Land Surveyors, LLC
81 Rankin Road
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Phone (860) 659-0587
Fax (860) 657-4429

Job: 131 - General Landscaping LLC
Sheet No: 1 Of: 1
Calculated By: MWF Date: 01/13/22
Checked By: Date:
Scale:

Elevation Stage	Area (ft^2)	Area Last Section (ft^2)	Average Area (ft^2)	Section Volume (CF)	Total Volume (CF)
94.0	936	0	0	0	0
95.0	1314	936	1125	1125	1125
96.0	1767	1314	1541	1541	2666
96.5	2005	1767	1886	943	3609
97.0	2244	2005	2125	1062	4671

APPENDIX E
NITROGEN LOADING CALCULATIONS

MEGSON, HEAGLE & FRIEND
CIVIL ENGINEERS & LAND SURVEYORS, LLC
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GLASTONBURY, CONNECTICUT 06033
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January 14, 2022

131-20 NITROGEN LOADING CALCULATIONS

GENERAL LANDSCAPING, LLC – 121 KREIGER LANE, GLASTONBURY

PARCEL AREA: 40,073 SF = 0.920 AC.

IMPERVIOUS SURFACE

PAVEMENT = 27,878 SF

LAWN AREA = 9,695 SF

NATURAL AREA = 2,500 SF

CONNECTICUT RAINFALL = 44 IN./YR

LOADING FACTORS:

CAPE COD TECH BULLETIN 91-001

DRIVES – 1.5 mg/L

LAWNS – 3 LBS / 1000 SF @ 40 % LEACHING

NATURAL AREA INFILTRATION – 40%

ESTIMATED LOADING

PAVED AREA:
27,878 SF X 44 IN/YR X 1 FT/12 IN X 1 YR/365 D X 28.32 L/CF
= 7,931 L/D X 1.5 mg/L = 11,897 mg/D

LAWN:
9,695 SF X 3 LBS/1000 SF/YR X 1 YR/365 D X 454,000 mg/LB X 0.4
= 14,471 mg/D

NATURAL AREA:
2,500 SF X 44 IN/YR X 1 FT/12 IN X 1 YR/365 D X 28.32 L/CF X 0.4
= 284 L/D

SUMMARY:

CONCENTRATION		
PAVED AREA	+	LAWNS
11,897 mg/D		14,471 mg/D
284 L/D		7,931 L/D
NATURAL AREA	+	PAVED AREA

= (26,368 mg/D) / (8,215 L/D) = 3.21 mg/L

THIS SITE IS LOCATED IN A GW-1 ZONE

NITROGEN LOADING OF 3.21 mg/L IS WITHIN THE ACCEPTABLE RANGE OF SECTION 20.13.1 OF THE GROUNDWATER PROTECTION REGULATIONS.

APPENDIX F
ORIGINAL DRAINAGE REPORT
OAK STREET INDUSTRIAL SUBDIVISION
FEBRUARY 20, 1986

DRAINAGE CALCULATIONS

FOR

OAK STREET INDUSTRIAL SUBDIVISION

FEBRUARY 20, 1986

MEGSON & HEAGLE

CIVIL ENGINEERS & LAND SURVEYORS

GLASTONBURY, CONNECTICUT

Attached are the drainage calculations for the Oak Street Subdivision. The storm drainage system is designed based on the assumption that 70% of each lot will be either pavement or building coverage and 30% will be grassed. The assumption is also made that each lot will have a storm drainage system for it's parking area and the design of the proposed system takes that into consideration.

All catchbasins from station 9+35 to station 19+75 will discharge into Hubbard Brook. The discharge will be 33.2 CFS at a velocity of 4.5 FPS for a 10 year frequency storm.

All catchbasins from station 6+40 to 1+05 will connect to the system proposed for the Oak Street reconstruction. The discharge into this system will be 21.2 CFS at a time of concentration of 25 minutes for a ten year frequency storm. This connection has been coordinated with the design of the Oak Street reconstruction with the Town engineering staff.

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033

MGM
Project No. 94-84
Sheet No. 1 of 2 Sheets
Date 1-22-86
Designed By MWF
Checked By

RUNOFF FROM PARKING TO CB STA 9+35 LT

.65 AC PAVED .25 AC GRASSED
AI = (.65 x .9) + (.25 x .3) = .66

RUNOFF FROM PARKING TO CB STA 9+35 RT

1.30 AC PAVED .50 AC GRASSED
AI = (1.30 x .9) + (.50 x .3) = 1.32

RUNOFF FROM PARKING TO CB 11+65 LT

2.05 AC PAVED .65 AC GRASSED
AI = (2.05 x .9) + (.65 x .3) = 2.04

RUNOFF FROM PARKING TO CB 11+65 RT

.65 AC PAVED .25 AC GRASSED
AI = .66

RUNOFF FROM PARKING TO CB 14+85 LT

1.65 AC PAVED .25 AC GRASSED
AI = .66

RUNOFF FROM PARKING TO CB 14+85 RT

1.30 AC PAVED .25 AC GRASSED
AI = 1.32

RUNOFF FROM PARKING TO PIPE BETWEEN 14+85 RT & 17+50

1.10 AC PAVED 2.0 AC GRASSED
AI = (1.1 x .9) + (2.0 x .3) = 1.59
T_c = 20 MIN

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033

MGM
Project No. 94-89
Sheet No. 2 of 2 Sheets
Date 1-23-86
Designed By MWF
Checked By

RUNOFF FROM PARKING TO CB STA 6+40 LT & RT

.65 AC PAVED .25 AC GRASSED

AI = .66

RUNOFF FROM PARKING TO CB STA 4+80 RT

1.70 AC PAVED .70 AC PAV

AI = (1.70)(.9) + (.70)(.3) = 1.74

RUNOFF FROM PARKING TO CB 9+80 LT

AI = .66

CIVIL ENGINEERS & LAND SURVEYORS
81 FRANKIN ROAD
GLASTONBURY, CONNECTICUT 06033
PHONE 659-0587

Storm Sewer System Design 10 YR STORM

Project 94-84 OAK STREET

Town GLAST.

Designed by MWF 1-22-86

Checked by

Sheet No.

1 Line Segment	2 Time to Inlet	3 Time in Pipe	4 Accumulated Time	5 AI Entering Catch Basin	6 Sum of AI in System	7 Rainfall Intensity	8 Q in System	9 Pipe Size	10 Length of Pipe	11 Slope	12 Average Velocity	13 Full Capacity	14 Headwater (FT)	15 'n'
9+35 LT RT	13	-	13	.09	.75	4.3	3.2	15"	24'	1.0%	4.8	5.7	-	-
9+35 RT RT	13	37	13	.09	2.16	4.3	9.3	21"	230'	1.0%	6.1	14	-	-
11+65 LT RT	12	-	12	.08	2.12	4.4	9.3	21"	24'	1.0%	6.1	14	-	-
11+65 RT RT	12	50	14	.08	5.02	4.1	20.6	27"	320'	0.7%	6.5	23	2.5	-
14+85 LT RT	14	-	14	.12	.78	4.1	3.2	15"	24'	1.0%	4.8	5.7	-	-
14+85 RT RT	14	33	20	.12	8.83	3.4	30.0	30"	265'	1.0%	8.0	36	3.1	-
17+50 LT RT	17	-	20	.56	9.39	3.4	32.0	30"	175'	5.0%	-	80	3.1	-
19+25 RT RT	21	-	21	.66	10.05	3.3	33.2	42"	50'	.02%	4.5	40	2.6	-
6+40 LT RT	10	-	10	0	.66	4.7	3.1	15"	24'	1.0%	4.8	5.7	-	-
6+40 RT RT	10	20	10	0	1.32	4.7	6.2	15"	160'	3.0%	8.2	9.9	1.9	-
4+80 LT LT	10	-	10	.07	3.13	4.7	14.7	21"	24'	1.5%	8.0	17	2.6	-
4+80 RT LT	10	16	10	.07	3.86	4.7	18.1	21"	180'	3.0%	11	24	3.5	-
3+00 LT LT	10	17	11	.09	3.95	4.5	18.1	21"	190'	3.0%	11	24	3.5	-
1+10 RT 1+05 LT	13	-	13	.16	.16	4.3	.69	15"	32'	1.0%	3	5.7	-	-
1+05 LT EXST BASIN	25	-	25	2.74	6.85	3.1	21.24	21"	35'	3.0%	11	24	3.5	-

MEGSON & HEAGLE
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PHONE 659-0387

Project 84 - 84 OAK STREET

Town GLASTONBURY

Designed by MWF

Checked by

Sheet No.

Gutter Flow Analysis 10 YR STORM

Inlet Number	Time to Inlet	Area in Acres	Runoff Coefficient	AI	Sum of AI	Total AI	Rainfall Intensity	Q to Inlet	Grade of Gutter %	Cross Slope of % Shoulder	Depth of Flow at Gutter	Width of Flow	Q Bypassing Inlet	AI Bypassing Inlet	AI Entering Catch Basin
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
9+35 LT	13	.06	.9	.06	.09	.09	4.3	.39	1	3	-	-	-	-	.08
		.11	.3	.03											
11+65 LT	12	.10	.9	.06	.08	.08	4.4	.40	1	3	-	-	-	-	.08
		.07	.3	.02											
14+85 LT	14	.10	.9	.09	.12	.12	4.1	.49	1	3	-	-	-	-	.12
		.10	.3	.03											
17+50	17	.33	.9	.30	.56	.56	3.8	2.13	0	0	-	-	-	-	.56
		.88	.3	.26											
9+35 RT	13	.06	.9	.03	.09	.09	4.3	.39	1	3	-	-	-	-	.09
		.11	.3	.03											
11+65 RT	12	.07	.9	.02	.08	.08	4.4	.40	1	3	-	-	-	-	.08
		.07	.3	.02											
14+85 RT	14	.10	.9	.03	.12	.12	4.1	.49	1	3	-	-	-	-	.12
		.10	.3	.03											
4+80 LT	10	.04	.9	.03	.07	.07	4.7	.33	1	2	-	-	-	-	.07
		.09	.3	.04											
3+00 LT	10	.05	.9	.05	.09	.09	4.7	.42	1	3	-	-	-	-	.09
		.13	.3	.04											
1+05 LT	25	3.0	.9	2.7	2.74	2.74	3.1	8.49	1	3	-	-	-	-	2.74
		.13	.3	.04											
4+80 RT	10	.04	.9	.04	.07	.07	4.7	.33	1	3	-	-	-	-	.07
		.09	.3	.03											
1+10 RT	13	.11	.9	.14	.16	.16	4.3	.69						-	.16
		.21	.3	.08											

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS
81 RANKIN ROAD
GLASTONBURY, CONNECTICUT 06033

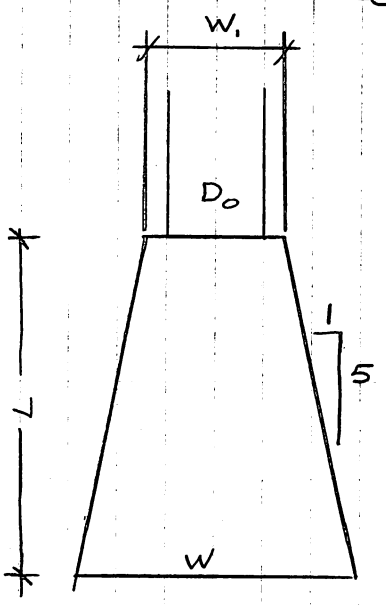
Project No. 94-84
Sheet No. 1 of 1 Sheets
Date 1-23-86
Designed By MWF
Checked By

GIVEN: $D_o = 3.5'$ $Q = 33.2$ CFS $V = 4.5$ FPS
$T_w = .72$

$$L_a = \frac{1.7\,Q}{D_o^{3/2}} + 8D_o$$

$$L_a = \frac{(1.7)(33.2)}{(3.5)^{3/2}} + 8(3.5)$$

$= 36.6$ FT $\approx$ 40 FT



$W = 3D_o + 0.4\,L_a$

$W = (3)(3.5) + (0.4)(40) = 26.5$ FT

$W_1 = 3D_o = 10.5$ FT

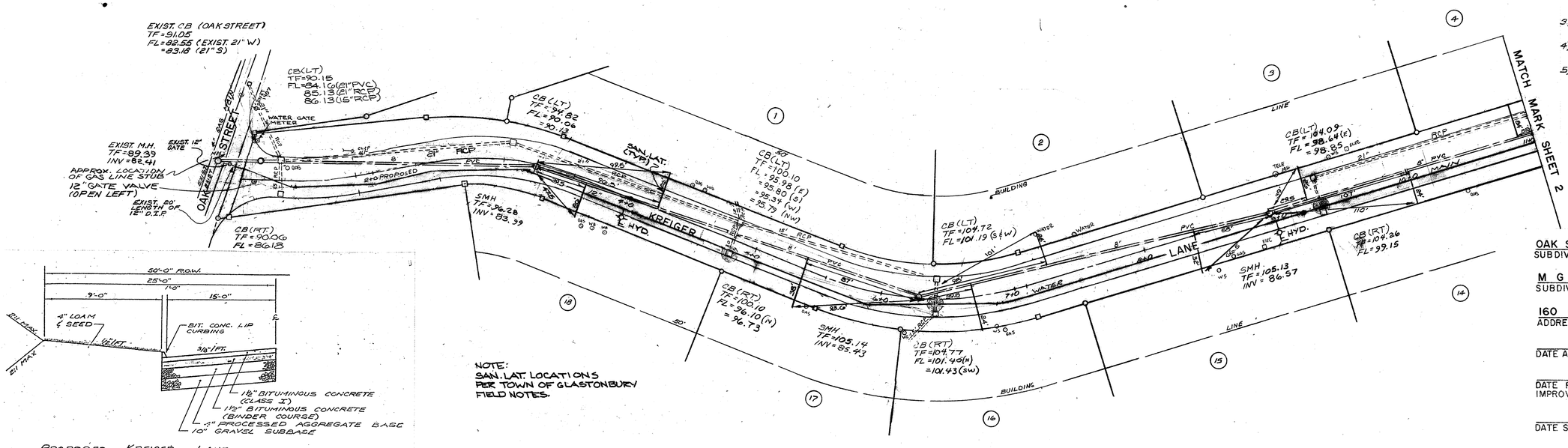
$$D_{50} = \frac{0.02}{T_w}\left(\frac{Q}{D_o}\right)^{4/3} = \left(\frac{0.02}{.72}\right)\left(\frac{33.2}{3.5}\right)^{4/3}$$

$= .56$ FT $= 7$ INCHES

USE INTERMEDIATE RIP RAP

SO
$W_1 = 10.5$ FT
$L = 40.0$ FT
$W = 26.5$ FT

APPENDIX G
OAK STREET INDUSTRIAL SUBDIVISION
ROADWAY RECORD DRAWINGS



NOTE:
SAN. LAT. LOCATIONS PER TOWN OF GLASTONBURY FIELD NOTES.

PROPOSED KREIGER LANE
HALF SECTION
(NOT TO SCALE)

PROP
WATER NOTES

1). GATE VALVE OPERATIONS FOR THIS PROPOSED PROJECT SHALL OPEN LEFT.

2). ALL GATE VALVES AND BLOW-OFFS SHALL BE FURNISHED WITH GATE BOXES.

3). ALL FITTINGS SHALL BE MECHANICAL JOINT TYPE, UNLESS OTHERWISE NOTED.

4). MINIMUM DEPTH OF COVER OVER WATER MAIN SHALL BE 4.5 FEET.

5). ALL MATERIALS & WORKMANSHIP SHALL CONFORM WITH THE "WATER SERVICE MANUAL OF THE M.D.C." REVISED JAN. 1985.

NOTE:
GAS MAIN SHALL BE LOCATED WITHIN TRAVELED WAY, 5'± SOUTH OF NORTH CURB PER 'C.N.G.'.

LENGTH OF RESTRAINT:

295.0'
- 84.8
210.5' HEAD

210.5' X 49.0089 / 314.16 = 32.83'

OAK STREET INDUSTRIAL SUBDIVISION — PLANNED INDUSTRIAL
SUBDIVISION NAME — ZONE

M G M ASSOCIATES
SUBDIVIDER

160 OAK STREET GLASTONBURY, CONN. 06033
ADDRESS

DATE APPLICATION RECEIVED — COMMUNITY DEVELOPMENT DIRECTOR

DATE PUBLIC IMPROVEMENTS APPROVED — DIRECTOR OF PUBLIC WORKS

DATE SUBDIVISION APPROVED — PLAN AND ZONING COMMISSION CHAIRMAN

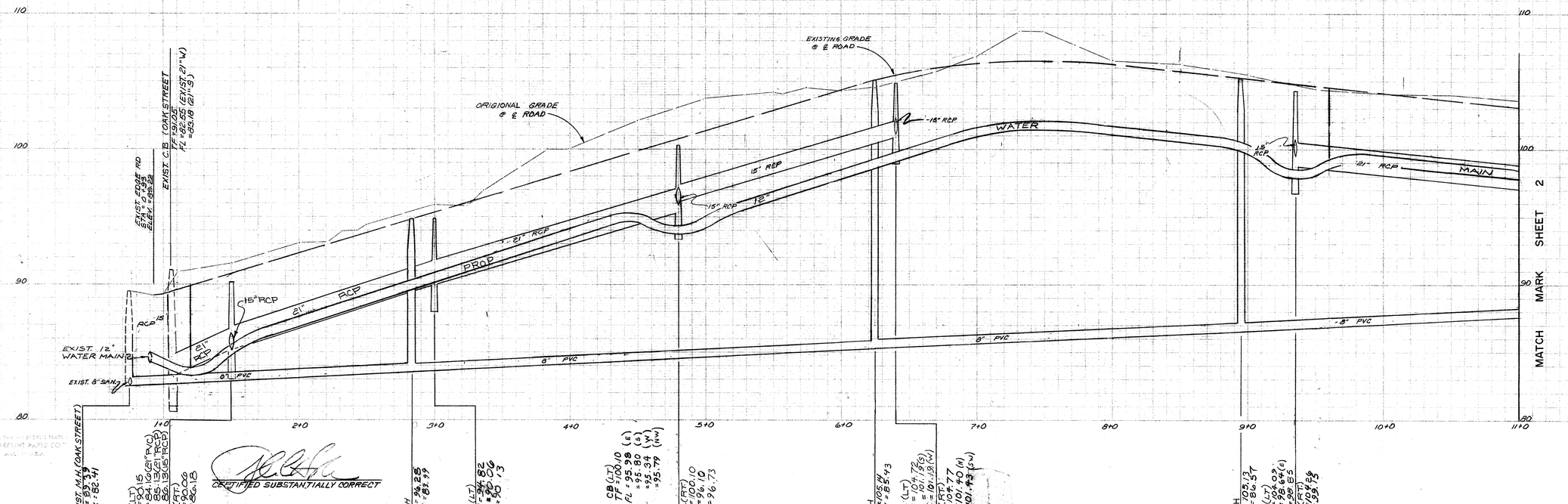
PLAN AND ZONING COMMISSION SECRETARY

DATE SUBDIVISION EXPIRES — FILE NO.

Billy G. Taylor
APPROVED - TOWN ENGINEER — WATER ONLY - HYDRANT LOCATIONS PER FIRE MARSHAL

Robert Mann
APPROVED - DEVELOPER

SCALE:
PLAN: 1" = 40'
PROFILE: 1" = 40' HORIZ.
1" = 4' VERT.



EXIST. M.H. TF=89.39 INV=82.41
CB(LT) TF=90.15 FL=84.16 (61" PVC) 85.13 (61" RCP) 86.13 (15" RCP)
CB(RT) TF=90.06 FL=86.18
SMH TF=96.28 INV=83.39
CB(LT) TF=94.82 FL=90.06 =90.13
CB(LT) TF=100.10 FL=95.98 (E) =95.80 (S) =95.34 (W) =95.79 (NW)
CB(RT) TF=100.10 FL=96.10 =96.73
SMH TF=105.14 INV=85.43
CB(LT) TF=104.72 FL=101.19 (S & W)
CB(RT) TF=104.77 FL=101.40 (N) =101.43 (SW)
SMH TF=105.13 INV=86.57
CB(LT) TF=104.09 FL=98.64 (E) =98.85
CB(RT) TF=104.26 FL=99.15

CERTIFIED SUBSTANTIALLY CORRECT

"RECORD DRAWING"
ROAD DRAINAGE
SANITARY & WATER
PLAN & PROFILE
KREIGER LANE
OAK STREET
INDUSTRIAL SUBDIVISION
PREPARED FOR
M G M ASSOCIATES
GLASTONBURY, CONN.

REV. 10-26-88 RECORD DRAWING
REV 3-3-87 STORM SEWER
REV. 2-3-87 MDC COMMENTS

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS
GLASTONBURY, CONN.

DATE: 12-18-86 | SCALE: SHOWN | MAP NO. 94-84-1D

SHEET 1 OF 2 SHEETS

OAK STREET INDUSTRIAL SUBDIVISION — PLANNED INDUSTRIAL
SUBDIVISION NAME — ZONE

M G M ASSOCIATES
SUBDIVIDER

160 OAK STREET GLASTONBURY, CONN. 06033
ADDRESS

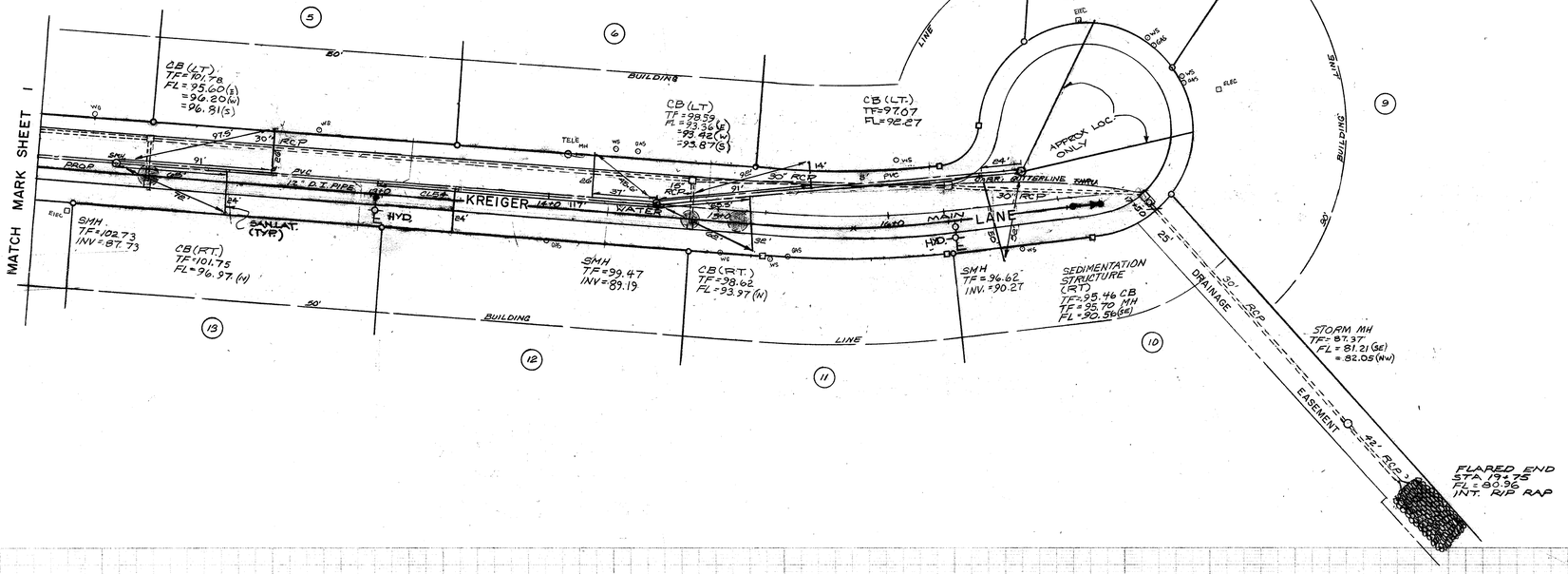
DATE APPLICATION RECEIVED — COMMUNITY DEVELOPMENT DIRECTOR

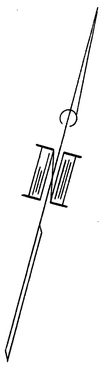
DATE PUBLIC IMPROVEMENTS APPROVED — DIRECTOR OF PUBLIC WORKS

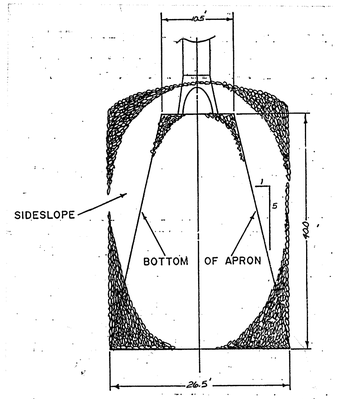
DATE SUBDIVISION APPROVED — PLAN AND ZONING COMMISSION CHAIRMAN

PLAN AND ZONING COMMISSION SECRETARY

DATE SUBDIVISION EXPIRES — FILE NO.

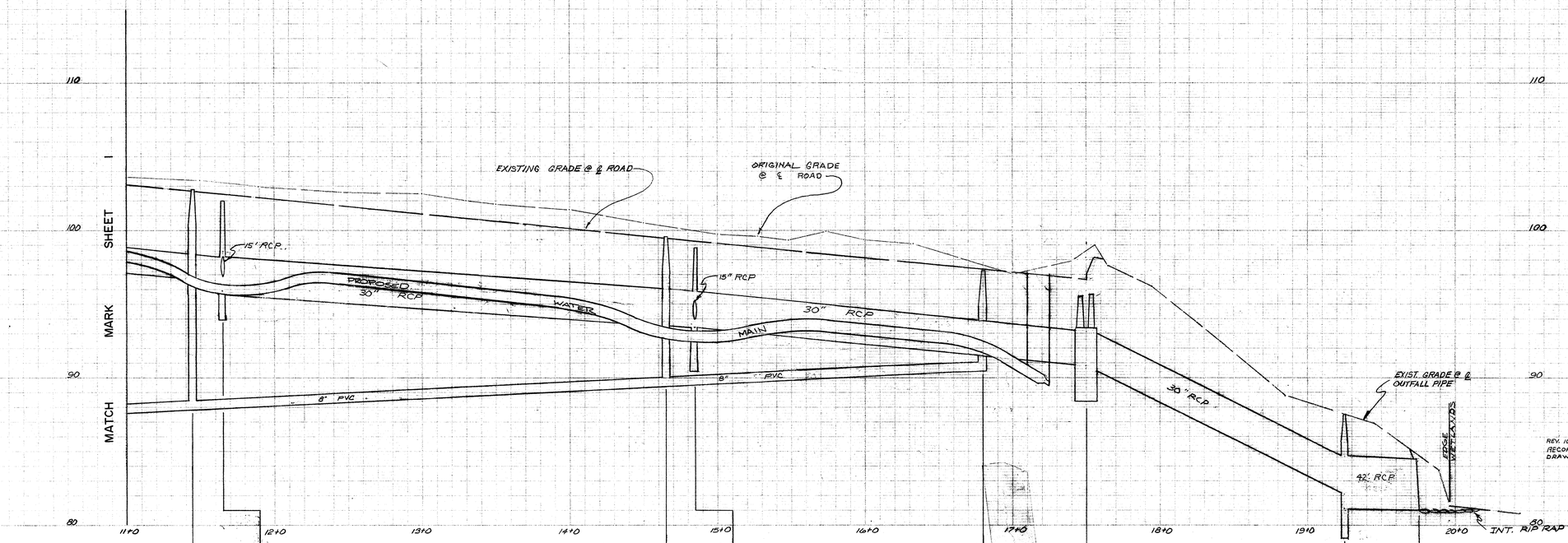






PROP. DRAINAGE OUTLET DETAIL
NO SCALE.

SCALE:
PLAN: 1" = 40'
PROFILE: 1" = 40' HORIZ
1" = 4' VERT.



"RECORD DRAWING"
ROAD DRAINAGE
SANITARY & WATER
PLAN & PROFILE
KREIGER LANE

OAK STREET INDUSTRIAL SUBDIVISION

PREPARED FOR

M G M ASSOCIATES

GLASTONBURY, CONN.

REV. 10-26-88 RECORD DRAWING
REV. 3-16-87 STORM SEWER
REV. 3-2-87 STORM & SAN. SEWER
REV. 2-20-87 SAN LAT. STA 14+90 RT., WATER STA 16+00 TO 17+00
REV. 2-3-87 MDC COMMENTS

MEGSON & HEAGLE
CIVIL ENGINEERS & LAND SURVEYORS
GLASTONBURY, CONN.

DATE: 12 - 18 - 86 | SCALE: SHOWN | MAP NO. 94 - 84 - ID

SHEET 2 OF 2 SHEETS