"AS-BUILTS"

CARRIAGE HILLS SUBDIVISION

PHASE TWO B

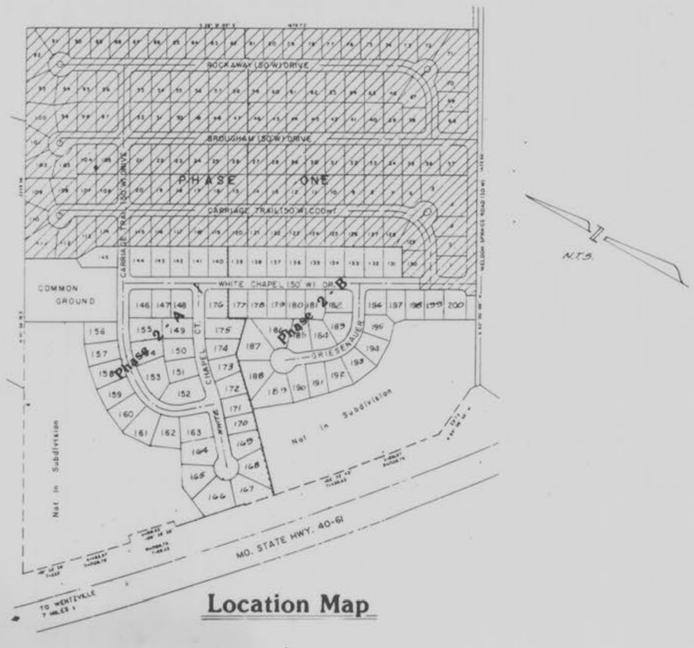
A FRACTIONAL PART OF U.S. SURVEY 1669,
TOWNSHIP 46 NORTH, RANGE 3 EAST
5th PRINCIPAL MERIDIAN,
O'FALLON, ST. CHARLES COUNTY, MISSOURI

City of O'Fallon

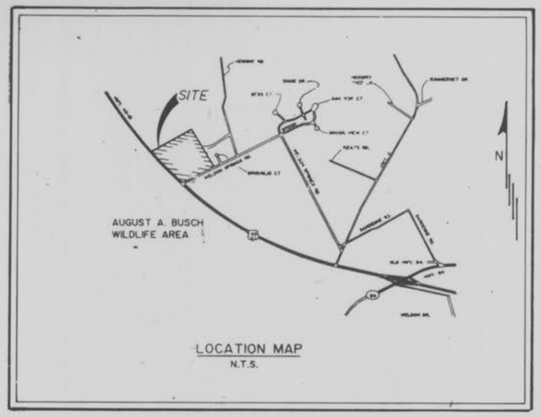
General Notes

1. Gas, water and other underground utilities shall not conflict with the depth or horizontal locations of existing and proposed sanitary and storm sewers, including house laterals.
2. Underground utilities have been plotted from available information and, therefore, their locations must be considerd approximate only. The verification of the location of all underground utilities, either shown or not shown on these plan, shall be the responsibility of the contractor, and shall be located prior to grading or construction of improvements.
3. Polyvinyl Chloride (PVC) shall conform to the requirements of ASTM D-3034 Standard Specifications for the PSM Polyvinyl Chloride (PVC) Sewer Pipe and Fittings, SDR-35.
4. Storm sewers 18" in diameter or smaller shall be ASTM C-14.
5. Storm sewers 21" in diameter or larger shall be ASTM C-76, Class II.
6. All storm sewer pipe under pavement, regardless of size, shall be reinforced concrete pipe (ASTM C-76, Class III) unless noted otherwise on the plans.
7. Corrugated metal pipe shall conform to the standard specifications for corrugated culvert pipe M-36, A.A.S.H.O. See plans for gauge. **All pipe shall be aluminized or bituminous coated.**
8. All filled places under buildings, proposed sanitary and storm sewer lines, and/or paved areas including trench backfills shall be compacted to 90% of maximum density as determined by the "Modified A.A.S.H.O. T-180 Compaction Test" (ASTM D-1557) unless otherwise specified by the local governing authority specifications. All tests will be verified by a Soils Engineer.
9. All earthen filled places within State, County, or City roads (Highways) shall be compacted to 90% of maximum density as determined by the "Standard Proctor Test A.A.S.H.O. T-99" (ASTM D-698) unless otherwise specified by local governing authority specifications. All tests will be verified by a Soils Engineer.
10. All storm and sanitary trench backfills shall be water jetted. Granular fill will be used under paved areas.
11. Easements shall be provided for storm sewers, sanitary sewers, and all utilities on the record plat. See record plat for location and size of easements. This does not apply to house laterals.
12. No area shall be cleared without the permission of the developer.
13. All grade shall be within 0.2 feet (more or less) of those shown on the grading plan.
14. No slope shall be greater than 3:1 and shall be either sodded or seeded and mulched.
15. Hazard markers will consist of three (3) standard specification, "Manual on Uniform Traffic Control Devices", end of roadway markers mounted on two (2) pound "U" channel sign post. Each marker shall consist of an eighteen (18) inch diamond reflectorized red panel. The bottom of each panel shall be mounted a minimum of four (4) feet above the elevation of the pavement surface.
16. All manhole and curb inlet tops built without elevations furnished by the Engineer will be the responsibility of the sewer contractor. At the time of construction stake-out of the sewer lines, all curb and grate inlets will be face staked. If normal face stakes fall in line with sewer construction, the Engineer will set these stakes on a double offset. It shall be the responsibility of the sewer contractor to preserve all face stakes from destruction.
17. All standard street curb inlets to have front of inlet 2 feet behind curb.
18. The minimum vertical distance from the low point of the basement to the flowline of a sanitary sewer at the corresponding house connection shall not be less than the diameter of the sanitary sewer plus a vertical distance of not less than 2-1/2 feet.
19. Water Lines, valves, sleeves, meters and etc. shall meet all specifications and installation requirements of the local governing authority.
20. All cast iron pipe for water mains shall conform to A.W.W.A. specification C-106 and/or C-108. The cast iron fittings shall conform to A.W.W.A. specification C-110. All rubber gasket joints for water cast iron pressure pipe and fittings shall conform to A.W.W.A. specification C-111.
21. All water hydrants and valves shall be cast iron and installed in accordance with plans and details.
22. All sanitary and storm sewers shall meet all specifications and installation requirements of the local governing authority.
23. All PVC water pipe shall have a minimum pressure rating of PR-200 or SDR-21.
24. All PVC sanitary sewer pipe shall be DR-35 or equal with crushed stone bedding uniformly graded between 1" and 1/4" size. This bedding shall extend from 6" below the pipe to 12" above the top of the pipe.
25. All grading on Missouri State Highway Right-of-Way shall be seeded and mulched and all disturbed Right-of-Way markers shall be reset at the completion of grading.
26. All streets must meet the specifications and installation requirements of the City of O'Fallon.
27. All sanitary manhole tops shall be set 0.2' higher than the proposed ground except in pavement areas.
28. ~~All sanitary manholes shall have a 31 mil thick coat of coal tar pitch waterproofing.~~
29. All sanitary service lines shall have a 6" diameter for Multi-family and a 4" diameter for Single-family developments.
30. ~~Manhole frame and cover shall be Clay and Bailey No. 2008 for Neenah R-1736 or Dector 1315 or approved equal.~~
31. The Duckett Creek Sewer District shall be notified at least 48 hours prior to construction of sanitary sewers for coordination and inspection.
32. All existing improvements damaged or destroyed during construction shall be replaced or repaired in kind.
33. Brick shall not be used on manholes.
34. Sewer contractor shall maintain 24' vertical separation between all storm sewers and the sludge force main. Contractor shall be responsible for verifying separation prior to storm sewer installation.
35. This tract is served by:

St. Charles Gas Co.
Water District No. 2
Union Electric Co.
Southwestern Bell
Duckett Creek Sewer Dist.
Wentzville Fire Dist.
Francis Howell



Location Map



LOCATION MAP
N.T.S.

Key Map

Index

Sheet	Description
1	COVER SHEET
2 ~~2-3~~	FLAT PLANS
~~4-5~~	~~GRADING PLANS~~
~~6~~	~~STREET PROFILES~~
3 ~~7~~	SANITARY PROFILES
4 ~~8~~	SANITARY & STORM PROFILES
5 ~~9~~	STORM SEWER PROFILES
~~10-11~~	~~DRAINAGE AREA MAP~~
6 ~~12-13~~	WATER MAIN LAYOUT
~~14-18~~	~~DETAILS~~

Benchmark

REFERENCE BENCHMARK- CHISLED SQUARE ON TOP OF WINGWALL AT EAST END OF WESTBOUND U.S. HIGHWAYS 40 & 61 BRIDGE OVER DARDENNE CREEK. ELEV.- 501.92 (FEET NGVD)(RM 74, U.S. DEPT. OF HOUSING AND DEV. NATIONAL FLOOD INSURANCE STUDY, COMMUNITY-PANEL NO. 290315 0250 A, PAGE 250 OF 350).

SITE BENCHMARK NO. 1- CHISLED SQUARE ON N.W. COR. OF WESTBOUND U.S. HIGHWAYS 40 & 61 CULVERT HEADWALL, STA. 406+75 (APPROX. 0.4 MI. WEST WELDON SPRINGS RD.) ELEV.- 501.51

SITE BENCHMARK NO. 2- SPIKE IN S. SIDE OF TREE ON NORTH SIDE OF WELDON SPRINGS RD.(APPROX 1300 FEET EAST OF HWY 40-61) ELEV. 565.00.

Legend

Sanitary Sewer (Proposed)		C.I.	Curb Inlet
Sanitary Sewer (Existing)		D.C.I.	Double Curb Inlet
Storm Sewer (Proposed)		G.I.	Grate Inlet
Storm Sewer (Existing)		A.I.	Area Inlet
Water Line & Size	6W	D.A.I.	Double Area Inlet
Tee & Valve		C.C.	Concrete Collar
Hydrant		F.E.	Flared End Section
Cap		E.P.	End Pipe
Lot or Building Number	18	E.D.	Energy Dissipator
Existing Fence Line		M.H.	Manhole
Existing Tree Line		C.P.	Concrete Pipe
Street Sign		R.C.P.	Reinforced Concrete Pipe
Direction of Proposed Residence		C.M.P.	Corrugated Metal Pipe
Existing Contour	504	C.I.P.	Cast Iron Pipe
Proposed Contour	504.0	P.V.C.	Polyvinyl Chloride
Grouted Rip-Rap		V.C.P.	Vitrified Clay Pipe
End of Lateral		C.O.	Clean Out
Asphalt Pavement		V.T.	Vent Trap
Concrete Pavement			
Storm/Sanitary Structure	C 20 / SM 21		
Test Hole			
Power Pole			
Light Standard			

This is to certify to Duckett Creek Sewer Dist. that these "As-Built" San. / Storm plans are based on actual field surveys conducted during Jan, 19 92 and the results are shown here on.

by Pickett Ray & Silver

Delmar F. Vincent
MO R.L.S. No 1869

Date

ENGINEERS AUTHENTICATION

The responsibility for professional engineering liability on this project is hereby limited to the set of plans authenticated by the seal, signature and date hereunder attached. Responsibility is disclaimed for all other engineering plans involved in the project and specifically excludes revisions after this date unless reauthenticated.

PICKETT RAY & SILVER INC

RAY PICKETT E-14395

Signature Date

"AS-BUILTS" 1-14-92
3-20-90 K.A.W.
2. Rev. per City of O'Fallon - 10-16-89, JWE
1. Rev. per City of O'Fallon & Duckett Creek; 07-89 DWD

PICKETT RAY & SILVER
Civil Engineers
Planners
Land Surveyors
333 Mid Rivers Mall Dr.
St. Peters, MO. 63376
447-1211 278-1211

PREPARED FOR:
Purler-Cannon-Schulte, Inc.
828 O'Fallon Road
St. Charles, Missouri
441-6221

DRAWN JWE DATE 8-16-89
CHECKED DATE
FIELD BOOK
PROJECT # 89-047 A
JOB ORDER # 3525

1/6/18

CARRIAGE HILLS - 2B

City of O'Fallon, Mo.

Flat Plan

CARRIAGE HILLS PHASE 2-B

Aug., 1989 89-047 A

Rev. 6/30/91 - PHD - per Duckett Creek

"AS-BUILTS" 1-14-92

See Sheet 3 of 18

PHASE 2-A

PHASE 2-B

MISSOURI STATE HIGHWAY 40-61

Not Part of Subdivision

Briegauer Ct. (50'W.)

Chapel Drive (50'W.)

White Chapel Drive (50'W.)

Carriage Trail Ct (50'W.)

CARRIAGE HILLS SUBDIVISION PHASE 1

SCALE: 1" = 50'

Typical Lot Number

Typical Lateral Station

Typical Sanitary Sewer Lateral with Disconnect Clean-out (See Details This Sheet).

NOTE: SHADED "BALLOONS" INDICATE "AS-BUILT" STRUCTURES.

Note: Use clean rock backfill in storm sewer trench @ sanitary sewer crossings.

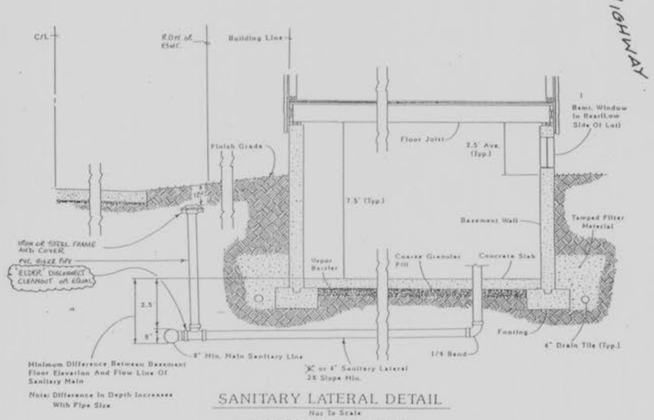
Note: Disconnect Cleanouts to be installed with Phase 2-B laterals (except Lot 188).

Note: Existing 8" PVC line from MH 103 to Ex. MH B-4 is to be abandoned.

NOTE: Sanitary Sewer service shall not be interrupted due to abandonment of existing sewer line.

E WELDON SPRINGS ROAD (30'W.)

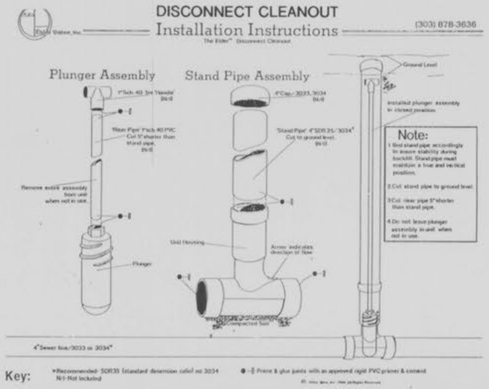
Prop. N/F ELZEA



SANITARY LATERAL DETAIL

Not To Scale

WITH DISCONNECT CLEAN-OUT



1-14-92

2/6/18

SANITARY SEWER PROFILES
CARRIAGE HILLS - PHASE 2
Aug., 1989 89-047A
"AS-BUILTS" 3-20-90
1-14-92

NOTE: A.B. = "AS-BUILT"

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, NO., BY, DATE

Ex. MH B-1 — MH 100 — MH 101 — MH 102

A.B. 512.50 (Invert Out)
Ex. T = 508.75
Conc. Encase
Granular Fill
Proposed Grade
A.B. 523.76 (Invert Out)
Existing Ground
A.B. 532.05 (Invert Out)
A.B. 535.67 (Invert Out)
A.B. E IN 499.10
A.B. E OUT 499.10
A.B. E IN 499.35
A.B. E OUT 513.54
A.B. E IN 521.69
A.B. E OUT 521.30
A.B. E IN 521.89
A.B. E OUT 526.52
Compacted Fill
Storm
A.B. 295.94' 8"P.V.C. @ 4.8%
A.B. 246.51' 8"P.V.C. @ 3.1%
A.B. 111.16' 8"P.V.C. @ 4.7%

MH 105 — MH 106

Sweep Invert
Existing Ground
Granular Fill
Proposed Grade
A.B. 530.96 (Invert Out)
A.B. 540.70 (Invert Out)
A.B. 543.00 (Invert Out)
A.B. E OUT 521.64
A.B. E IN 523.09
A.B. E OUT 530.64
A.B. E IN 530.72
A.B. E OUT 535.01
Conc. Encase
Storm
A.B. 272.38' 8"P.V.C. @ 2.6?
A.B. 246.65' 8"P.V.C. @ 0.93%

Ex. MH B-1 — MH 103 — MH 104

Top Adjusted To 515.39
Ex. T = 508.75
A.B. 512.50 (Invert Out)
Proposed Grade
Granular Fill
Existing Ground
A.B. 530.96 (Invert Out)
A.B. E IN 499.10
A.B. E OUT 499.10
A.B. E IN 499.35
A.B. E OUT 506.19
A.B. E IN 520.40
A.B. E OUT 521.84
A.B. E IN 522.00
Compacted Fill
Sweep Invert
Storm
A.B. 246.65' 8"P.V.C. @ 2.5%
A.B. 343.12' 8"P.V.C. @ 4.5%

MH 105 — MH 107

Existing Ground
Proposed Grade
Granular Fill
A.B. 540.70 (Invert Out)
A.B. 547.97 (Invert Out)
A.B. E OUT 530.64
A.B. E IN 530.72
A.B. E OUT 535.77
A.B. 201.' 8"P.V.C. @ 2.5%

MH 112 — MH 113 — MH 114

Granular Fill
Existing Ground
Proposed Grade
A.B. 537.13 (Invert Out)
A.B. 536.87 (Invert Out)
A.B. 543.12 (Invert Out)
A.B. E OUT 528.18
A.B. E (Inv.) 528.25
A.B. E OUT 528.97
A.B. E IN 528.64
A.B. E OUT 534.17
Ex. Storm
Conc. Encase Ex. Pipe See Detail 6A1.0.18
A.B. 65.28' 8"P.V.C. @ 1.2%
A.B. 203.19' 8"P.V.C. @ 2.5%

MH 111 — MH 115 — MH 116 — MH 117

A.B. 528.53 (Invert Out)
Granular Fill
Proposed Grade
A.B. 536.17 (Invert Out)
Existing Ground
A.B. 539.83 (Invert Out)
Granular Fill
A.B. 541.95 (Invert Out)
Conc. Encase
A.B. E OUT 518.06
A.B. E (Inv.) 518.73
A.B. E OUT 524.69
A.B. E IN 525.92
A.B. E OUT 528.19
A.B. E IN 528.38
A.B. E OUT 531.77
Sweep Invert
Storm
A.B. 239.89' 8"P.V.C. @ 2.5%
A.B. 144.16' 8"P.V.C. @ 2.0%
A.B. 285.17' 8"P.V.C. @ 1.0%

MH 115 — MH 118

Sweep Invert
Existing Ground
Proposed Grade
A.B. 536.17 (Invert Out)
A.B. 549.32 (Invert Out)
A.B. E OUT 524.69
A.B. E IN 524.99
A.B. E OUT 535.97
A.B. 150.95' 8"P.V.C. @ 7.0%

NOTE: A.B. = "AS-BUILT"

SCALE:
HORZ. - 1" = 50'
VERT. - 1" = 10'

ORIGINAL SURVEY — SURVEYED, PLOTTED, NOTE BOOK, NO., BY, DATE

HIGHWAY-FEDERAL AID SERIES
PLATE 3-FULL CROSS SECTION-LINE & DOT
TELEDYNE
PRINTED IN U.S.A.

"AS-BUILTS"

CARRIAGE HILLS 2-B

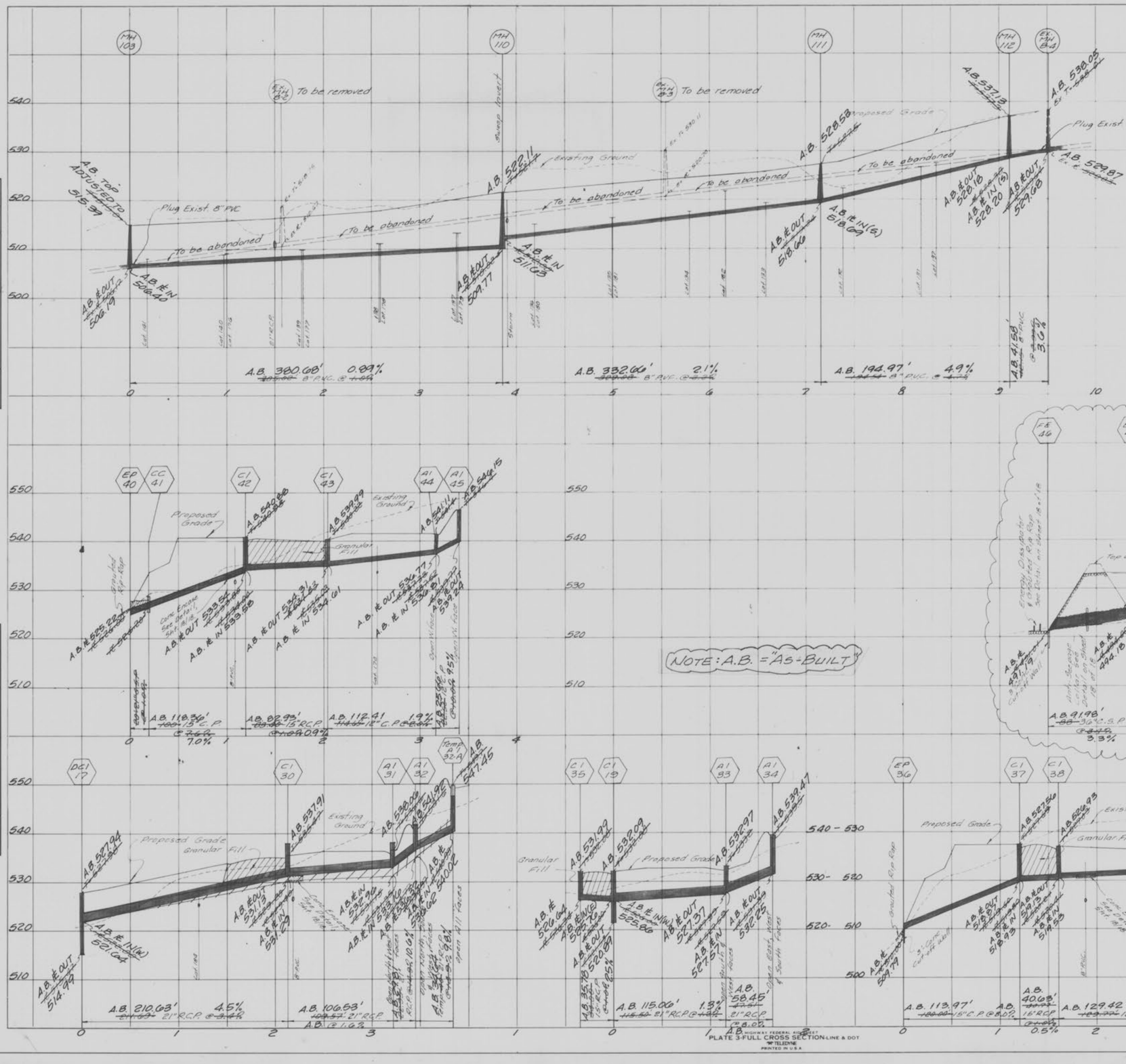
SANITARY & STORM SEWER PROFILES
CARRIAGE HILLS - PHASE 2
Aug., 1989 89-047A

"AS-BUILTS" 3-20-90
1-14-92

SCALE:
HORZ. - 1" = 50'
VERT. - 1" = 10'

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, NO., BY, DATE

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, NO., BY, DATE



DETENTION CALCULATIONS (25 Year)

Total Area of Tract 65.97 Acres
Area of Future Commercial 7.83 Acres

Developed Q of Tract 65.97 Ac. @ 3.26	=	215.06 cfs.
Undeveloped Q of Tract 65.97 Ac. @ 2.31	=	152.39 cfs.
Differential Runoff	=	62.67 cfs.
Developed Q of Comm. 7.83 Ac. x 4.75	=	37.19 cfs.
Undeveloped Q of Comm. 7.83 Ac x 2.31	=	18.09 cfs.
Differential Runoff	=	19.10 cfs.

Storage Required 81.77 cfs. x 1800 (30 min.) = 147,186 cu.ft.
Storage of Dry Pond @ elev. 503.30 = 160,403 cu.ft.

OVERFLOW PIPE CALCULATIONS

Capacity of 33" C.S.P. as an orifice

$Q = CA\sqrt{2gh}$

Constant C = 0.6
Area a = 5.94
Gravity g = 32.2
Ave. Head h = 7.925

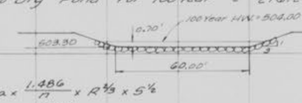
$Q = 0.6 \cdot 5.94\sqrt{2(32.2)7.925}$
$Q = 3.56\sqrt{510.37}$
$Q = 3.56 \times 22.59$
$Q = 80.42$ cfs.

Q to Dry Pond (25 Years) = 169.07 cfs.
Out Overflow Pipe = 80.42 cfs.
Storage Required = 88.65 cfs.

88.65 x 1800 (30 min.) = 159,570 cu. ft.

EMERGENCY SPILLWAY (Grouted R/R Rap)

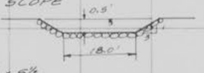
Q to Dry Pond for 100 Year = 216.29 cfs.



$Q = a \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$
$Q = 43.55 \times \frac{1.486}{0.0225} \times 0.773 \times 0.10$
$Q = 222.33$ cfs.

a = 43.55
wp = 44.42
S = 0.1 $S^{1/2}$ = 0.10
$R = \frac{43.55}{44.42} = 0.98$ $R^{2/3} = 0.773$
n = 0.0225

SIDE SLOPE



$Q = a \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$
$Q = 9.75 \times \frac{1.486}{0.0225} \times 0.596 \times 0.577$
$Q = 221.44$ cfs.

a = 9.75
wp = 21.16
S = 0.333 $S^{1/2}$ = 0.577
$R = \frac{2.75}{21.16} = 0.46$ $R^{2/3} = 0.596$
n = 0.0225

PLATE 3-FULL CROSS SECTION-LINE & DOT
TELEDYNE
PRINTED IN U.S.A.

"AS-BUILTS"
CARRIAGE HILLS 2-B

16/18

Storm Sewer Profiles
CARRIAGE HILLS PHASE 2
Aug., 1989 89-047 A

"AS-BUILTS" 3-20-90
1-14-92

NOTE: A.B. = "AS-BUILT"

SCALE:
HORZ. - 1"=50'
VERT. - 1"=10'

FINAL SURVEY — SURVEYED — PLOTTED — TYPIST — NOTE BOOK — NO. — AREAS — AREAS CHECKED — BY — DATE

ORIGINAL SURVEY — SURVEYED — PLOTTED — TYPIST — NOTE BOOK — NO. — AREAS — AREAS CHECKED — BY — DATE

NOTE: A.B. = "AS-BUILT"

PHASE 2-A ~ PHASE 2-B

PLATE 3-FULL CROSS SECTION-LINE & DOT
W. TELEDYNE
PRINTED IN U.S.A.

"AS-BUILTS"
CARRIAGE HILLS 2-B

Water Main Layout
CARRIAGE HILLS PHASE 2-B
Aug, 1989 89-047 A

"AS-BUILTS" 1-14-92

See Sheet 13 of 18

MISSOURI STATE HIGHWAY 40-61

Not Part of Subdivision

Chapel Drive (50'W.)

White Drive

Carriage Trail Ct (50'W.)

& WELDON SPRINGS ROAD (30'W.)

NOTE: SHADED "BALLOONS" INDICATE "AS-BUILT" STRUCTURES.

SCALE: 1"=50'

Existing

Proposed

1-14-92

"AS-BUILTS" CARRIAGE HILLS-2B