

# PAVING, GRADING, STORM DRAINAGE, SANITARY SEWER, & WATER MAIN IMPROVEMENT PLANS

FOR

## ST. JAMES WOODS CONDOMINIUM, PHASE II

A PLANNED UNIT DEVELOPMENT IN THE NW 1/4 OF SECTION 20, T3S, R6E  
PITTSFIELD CHARTER TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

THE IMPROVEMENTS COVERED BY THESE PLANS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2003 STANDARD SPECIFICATIONS FOR CONSTRUCTION.

### SITE DATA

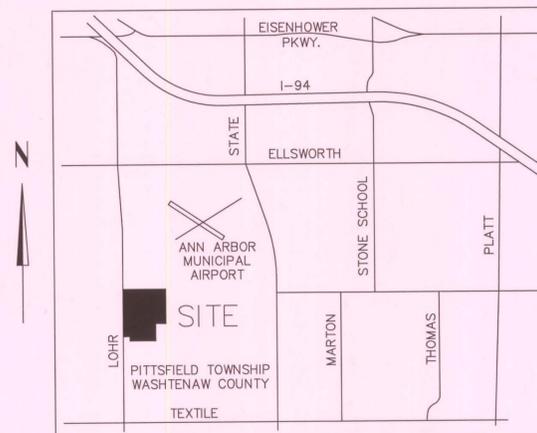
- DEVELOPER: ARCHCON MANAGEMENT  
BOX 131098  
ANN ARBOR, MICHIGAN 48113  
PHONE: (734) 547-0406  
FAX: (734) 547-0995
- ENGINEER: E. P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MICHIGAN 48198  
PHONE: (734) 481-1322  
FAX: (734) 481-2215
- SURVEYOR: E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MICHIGAN 48198  
PHONE: (734) 481-1322  
FAX: (734) 481-2215
- SITE DATA:
 

EXISTING	
GROSS AREA	68.61 AC.
ZONING	PUD
USE	SINGLE FAMILY
SETBACK REQ'S.:	
FRONT	35 FT.
SIDE	10' (25' BETWEEN ADJACENT HOUSES)
REAR	35 FT.
LOT SIZE	18,000 S.F.
LOT WIDTH	65 FT.
- DEVELOPMENT DATA:
 

	PHASE 1	PHASE 2	TOTAL
GROSS AREA	24.06 AC.	44.55 AC.	68.61 AC.
LOHR ROAD R/W			
EXISTING	0.54 AC.	0.85 AC.	1.39 AC.
PROPOSED	0.98 AC.	1.55 AC.	2.53 AC.
PROPOSED STREET R/W	1.76 AC.	5.85 AC.	7.61 AC.
NET SITE AREA	23.08 AC.	43.00 AC.	66.08 AC.
OPEN SPACE	15.71 AC.	12.32 AC.	28.03 AC.
NET RESIDENTIAL AREA	5.60 AC.	24.81 AC.	30.41 AC.
UNITS	11	50	61
DENSITY (UNIT/NET SITE)	0.48 UN./AC.	1.16 UN./AC.	0.92 UN./AC.
DENSITY (UNIT/NET RES.)	1.96 UN./AC.	2.01 UN./AC.	2.01 UN./AC.
AVG. LOT AREA	22,176 S.F.	21,614 S.F.	21,716 S.F.

### DEVELOPED BY:

ARCHCON MANAGEMENT  
P.O. BOX 131098  
ANN ARBOR, MI 48113  
PHONE: (734) 547-0406  
FAX: (734) 547-0995



### LOCATION MAP

NOT TO SCALE

NOTE: SEE SHEET 21A FOR WATERWAYS CONNECTION (PLAN & PROFILE)

### INDEX OF SHEETS

- TITLE SHEET
- GENERAL NOTES
- GENERAL SUMMARY & TYPICAL SECTIONS
- AREA PLAN
- EXISTING CONDITIONS
- OVERALL UTILITY PLAN
- OVERALL SURVEY & GEOMETRIC PLAN
- 8-10. PHASE II SURVEY & GEOMETRIC PLAN
- DRAINAGE AREA MAP
- 12A & 12B UTILITY DETAILS
- 13-14. STORM PLAN
- 15-16. SANITARY PLAN
- 17-18. WATER PLAN
- 19-20. GRADING PLAN
- 21-24. SANITARY, WATER, & PAVING PROFILES
- 25-26. STORM PROFILES
27. INTERSECTION DETAIL
28. CONSTRUCTION SIGNAGE
- 29-31. TRAFFIC CONTROL PLAN
32. EROSION CONTROL
- \*33-34. LANDSCAPE PLAN
35. LEAD SCHEDULE
36. STRUCTURE SCHEDULE
- 37-39. STANDARD SPECIFICATIONS
- 40-42. STANDARD DETAILS

### AS-BUILT

THIS SHEET DOES NOT CONTAIN FIELD MEASURED / AS-BUILT INFORMATION

\*NOTE: LANDSCAPE PLANS ARE NOT INCLUDED IN THIS SET. NO CHANGES WERE MADE TO THE APPROVED LANDSCAPE PLANS.

### AGENCY APPROVAL SCHEDULE

I. PRELIMINARY SITE PLAN	WCMP-C-SAC	01/12/95 (ADVISORY)
	WCRC	02/07/95
	PCT PLANNING COMMISSION PCT BOARD	12/13/94 02/07/95
II. FINAL SITE PLAN - PHASE II	MDNR-LWMD	09/22/95
	WCRC	08/20/96
	WCDC	09/04/96
	PCT PLANNING COMMISSION PCT BOARD	12/19/96

NOTE: SUBTRACT 0.387' FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

### BENCHMARK DATA (U.S.G.S.)

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90± NORTH AND 55± WEST OF NW CORNER, SECTION 20.  
ELEVATION ..... 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35± NORTH AND 35± EAST OF NW PROPERTY CORNER (PARCEL 12-20-200-004).  
ELEVATION ..... 826.67



### AS-BUILT PLANS PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

MICH AVE

RECORD SET

C.S.P.A. #96-22

REVISIONS	DATE	BY	REVISIONS	DATE	BY
2/20/07	GM	WCR/TWP	7/25/03	GM	
8/4/05	GM	WCR	5/22/03	GM	
7/11/05	GM	TWP	5/07/03	GM	
4/28/05	GM	REV (PITTSFIELD TWP.)	2/6/03	GM	
3/18/05	GM	REVISION	11/25/02	KMD	
1/17/05	GM	DRAINAGE AND GRADING REVISIONS	10/22/02	KMD	
1/14/05	GM	REVISION	08/30/02	KMD	
8/2/04	GM	REVISION	06/19/02	KMD	
3/31/04	GM	AKF	01/19/01	DATE	

ST. JAMES WOODS II

TITLE SHEET

E.P. KUBISKE & ASSOCIATES, INC. 1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734)481-1322 FAX (734)481-2215	SCALE HOR 1" = 1" VER 1" = 1" JOB NO. 00068 SHEET NO. 1 OF 42
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RECORD SET

RECORD SET

# GENERAL NOTES

**STANDARDS AND SPECIFICATIONS**

CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE STATE, COUNTY AND MUNICIPAL PERMITS AND REQUIREMENTS.

THE FOLLOWING PERMITS ARE REQUIRED PRIOR TO COMMENCEMENT OF COVERED CONSTRUCTION ACTIVITIES:

**WETLAND CONSTRUCTION**

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
LAND AND WATER MANAGEMENT DIVISION  
301 EAST LOUIS GLICK HIGHWAY  
JACKSON, MICHIGAN 49201  
(517)780-7900

**ACT 399 WATER CONSTRUCTION**

MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
3500 NORTH LOGAN STREET  
LANSING, MICHIGAN 48909  
(517)335-8000

**ACT 98 SANITARY SEWER CONSTRUCTION**

MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY  
301 EAST LOUIS GLICK HIGHWAY  
JACKSON, MICHIGAN 49201  
(517)780-7900

**COUNTY RIGHT-OF-WAY CONSTRUCTION**

WASHTENAW COUNTY ROAD COMMISSION  
555 NORTH ZEEB ROAD  
ANN ARBOR, MICHIGAN 48106  
(313)761-1500

**COUNTY DRAIN CONSTRUCTION**

WASHTENAW COUNTY DRAIN COMMISSION  
705 NORTH ZEEB ROAD  
ANN ARBOR, MICHIGAN 48107-8645  
P.O. BOX 8645  
(734)994-2525

**ACT 347 SOIL EROSION**

PITTSFIELD CHARTER TOWNSHIP  
6201 MICHIGAN AVE.  
ANN ARBOR, MICHIGAN 48108  
(734) 822-3130

THIS LIST IS NOT INTENDED TO BE EXHAUSTIVE; THE DEVELOPER/CONTRACTOR ARE RESPONSIBLE FOR OBTAINING ALL REQUIRED PERMITS.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH APPLICABLE SPECIFICATIONS FOR MATERIALS, UTILITY CONSTRUCTION, DRAINAGE IMPROVEMENT CONSTRUCTION, ROADWAY CONSTRUCTION AND WETLAND CONSTRUCTION.

**EXISTING UTILITIES**

LOCATIONS OF ALL EXISTING PUBLIC UTILITIES IS OBTAINED FROM THE BEST AVAILABLE DATA ON FILE WITH THE UTILITY COMPANIES AND THE MUNICIPALITY. MANNIK & SMITH OF MICHIGAN, INC. IS NOT RESPONSIBLE FOR OMISSIONS OR VARIATIONS FROM THE LOCATIONS SHOWN ON THESE PLANS.

VERIFICATION OF THE ACTUAL LOCATION OF EXISTING UTILITIES IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL CONTACT MISSDIG LOCATION SERVICES (PHONE NO. 1-800-482-7171) A MINIMUM OF 3 WORKING DAYS PRIOR TO THE COMMENCEMENT OF ANY CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES CAUSED BY HIS OPERATIONS OR FAILURE TO PROPERLY NOTIFY AFFECTED PARTIES.

FOLLOWING IS A LIST OF UTILITIES KNOWN TO BE IN THE VICINITY OF THE PROJECT:

<b>ELECTRIC</b>	<b>GAS</b>
DTE	MICHIGAN CONSOLIDATED GAS COMPANY
982 BROADWAY	3200 HOBSON
ANN ARBOR, MICHIGAN 48105	DETROIT, MICHIGAN 48201
(313)761-8716	(313)577-7398
<b>TELEPHONE</b>	<b>WATER AND SANITARY SEWER</b>
SBC	PITTSFIELD CHARTER TOWNSHIP
550 SOUTH MAPLE ROAD	6201 W. MICHIGAN AVE.
ANN ARBOR, MICHIGAN 48103	ANN ARBOR, MICHIGAN 48108
(313)221-4900	(734) 822-3130

EXCEPT AS OTHERWISE PROVIDED IN THESE PLANS, FLOW IN EXISTING STORM AND SANITARY SEWERS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION OF THIS PROJECT. WHERE THE PLANS PROVIDE FOR A PROPOSED SEWER TO BE CONNECTED TO, OR TO CROSS OVER OR UNDER AN EXISTING SEWER, IT IS THE CONTRACTOR'S RESPONSIBILITY TO LOCATE THE EXISTING PIPE BOTH AS TO LINE AND GRADE BEFORE COMMENCEMENT OF CONSTRUCTION OF THE PROPOSED SEWER. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES RESULTING FROM HIS OPERATIONS.

**PROPOSED UTILITIES**

PROPOSED GAS, ELECTRIC, TELEPHONE AND CABLE TELEVISION, AS APPLICABLE SHALL BE LOCATED IN A 12' WIDE PRIVATE EASEMENT FOR PUBLIC UTILITIES ABUTTING THE RIGHT-OF-WAY OF THE PROPOSED ROADS.

**CLEARING**

BID ITEM "CLEARING AND GRUBBING" SHALL BE CONSTRUED TO INCLUDE ALL WORK NECESSARY FOR THE REMOVAL AND DISPOSAL OF TREES, BUSHES, MISCELLANEOUS STRUCTURES AND ANY EXISTING MATERIALS OR "JUNK" TO FACILITATE THE CONSTRUCTION OF ALL IMPROVEMENTS AS DELINEATED ON THESE PLANS.

CLEARING ACTIVITIES SHALL BE PURSUED IN STRICT ACCORDANCE WITH THE LIMITS ON THESE PLANS. DEVIATION FROM THE DELINEATED LIMITS SHALL OCCUR ONLY WITH PRIOR WRITTEN PERMISSION OF THE OWNER'S ENGINEER.

**CONSTRUCTION STAKES**

THE FIRST SET OF CONSTRUCTION STAKES WILL BE PAID FOR BY THE OWNER. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT AND PRESERVE THE CONSTRUCTION STAKES. REPLACEMENT OF STAKES BY THE OWNER'S ENGINEER WILL BE AT THE CONTRACTOR'S EXPENSE. THE CONTRACTOR SHALL PROVIDE AT LEAST 48 HOURS (2 WORKING DAYS) NOTICE TO THE ENGINEER FOR THE REPLACEMENT OF STAKES.

48 HOURS (2 WORKING DAYS) NOTICE SHALL BE PROVIDED FOR THE ENGINEER TO STAKE THE JOB FOR CONSTRUCTION.

THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE CONSTRUCTION STAKES PRIOR TO CONSTRUCTION OF THE UTILITIES OR ROADWAY. DEVIATIONS FROM THE PLAN ELEVATION AND/OR LOCATION SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY. THE ENGINEER SHALL NOT BE RESPONSIBLE FOR LOST TIME OR DAMAGES DUE TO THE CONTRACTOR'S FAILURE TO REVIEW THE STAKES AND CUT SHEET INFORMATION.

**EARTH EXCAVATION**

EARTHWORK SHALL BE IN ACCORDANCE WITH SECTION 205 OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION 2003 STANDARD SPECIFICATIONS FOR CONSTRUCTION AND SHALL INCLUDE TOPSOIL STRIPPING IN THE ROADWAY INFLUENCE AREA, ALL EXCAVATION, EMBANKMENT, COMPACTION AND STOCKPILING OR PLACEMENT OF SURPLUS EXCAVATED MATERIAL OUTSIDE THE RIGHT-OF-WAY AS DIRECTED BY THE OWNER.

NO QUANTITY HAS BEEN ESTABLISHED FOR TOPSOIL STRIPPING. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION OF TOPSOIL DEPTHS PRIOR TO BIDDING.

TOPSOIL WHICH IS STRIPPED IN UPLAND AREAS SHALL BE STOCKPILED IN DESIGNATED LOCATIONS AND PROPER MEASURES TAKEN TO MINIMIZE SOIL EROSION. TOPSOIL FROM WETLAND AREAS SHALL BE STOCKPILED SEPARATELY IN DESIGNATED LOCATION, WITH CAUTION EXERCISED TO PREVENT MIXING THE DIFFERENT TOPSOIL MATERIALS.

DISTURBED AREAS SHALL BE PLANTED OR OTHERWISE PROTECTED FROM WIND/WATER EROSION AS SOON AS POSSIBLE AFTER DISTURBANCE. ALL EROSION CONTROL OR STABILIZATION MEASURES SHALL BE PROPERLY MAINTAINED.

EXCAVATED MATERIAL FROM THE ROADWAY AND UTILITY CONSTRUCTION WHICH IS DETERMINED TO BE SUITABLE FOR FILL, SHALL BE PLACED IN GENERAL FILL AREAS OUTSIDE THE RIGHT-OF-WAY.

WITHIN THE ROAD CORRIDOR, BACKFILL SHALL CONSIST OF GRANULAR MATERIAL CONFORMING TO MICHIGAN DEPARTMENT OF TRANSPORTATION CLASS II, COMPACTED TO 95% OF MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT. BACKFILL OUTSIDE RIGHT-OF-WAY MAY BE NATIVE EXCAVATED MATERIAL FREE FROM DELETERIOUS MATERIALS AND COMPACTED TO 85% MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT.

AN INDEPENDENT TESTING LABORATORY SHALL BE RETAINED BY THE CONTRACTOR TO PROVIDE DENSITY AND MATERIALS TESTING SERVICES. TESTS SHALL BE PERFORMED IN ACCORDANCE WITH THE SPECIFICATIONS OF THE WASHTENAW COUNTY ROAD COMMISSION AND PITTSFIELD CHARTER TOWNSHIP.

STOCKPILED TOPSOIL SHALL BE SPREAD FOUR (4) INCHES THICK MINIMUM OVER AREAS TO RECEIVE SEEDING OR LANDSCAPING TREATMENT. CARE SHALL BE TAKEN TO SPREAD THE WETLAND AND UPLAND TOPSOILS IN THEIR RESPECTIVE AREAS.

**SITE GRADING**

THE CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH THE GRADING REQUIREMENTS OF THESE PLANS, THE TOWNSHIP AND THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY. THE CONTRACTOR SHALL GRADE THIS PROJECT IN STRICT COMPLIANCE WITH THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY PERMIT CONDITIONS.

GRADING ACTIVITIES SHALL NOT BE PERMITTED TO EXTEND BEYOND THE PROPERTY LINES NOR BEYOND THE LIMITS AS DELINEATED ON THESE PLANS.

EXCESSIVE GRADING OR DAMAGE TO THE WETLAND AREAS DUE TO CONTRACTOR'S OPERATIONS SHALL BE CORRECTED AT THE EXPENSE OF THE CONTRACTOR.

PERMITTED SLOPES IN LAWN AREAS SHALL BE 1 FOOT VERTICAL ON 4 FEET HORIZONTAL (25%) MAXIMUM. DETENTION PONDS SHALL NOT EXCEED 1 FOOT VERTICAL ON 3 FEET HORIZONTAL (33%) FOR INTERIOR SLOPES.

THE GRADING PLAN ELEVATIONS FOR INDIVIDUAL UNITS ARE SHOWN AS BEING 18 INCHES BELOW FIRST FLOOR ELEVATION. BASEMENT EXCAVATION IS EXPECTED TO PROVIDE 6" - 9" OF FILL MATERIAL LEAVING THE FINISH GRADE OUTSIDE THE BUILDINGS APPROXIMATELY 12" LOWER THAN FIRST FLOOR.

**DEWATERING**

DEWATERING WELLS SHALL NOT BE PERMITTED TO UTILIZE INDIVIDUAL DISCHARGE LINES, BUT SHALL BE CONNECTED BY A HEADER PIPE WHICH DISCHARGES INTO THE EBERBACH DRAIN.

DISCHARGE FROM THE HEADER PIPE SHALL BE CONVERTED TO SHEET FLOW BY USE OF AN ENERGY DISSIPATOR TO PREVENT EROSION IN THE DRAIN.

**STORM SEWER**

THE STORM DRAINAGE CONCEPT MUST RECEIVE APPROVAL OF THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY, WASHTENAW COUNTY ROAD COMMISSION AND WASHTENAW COUNTY DRAIN COMMISSION PRIOR TO RECEIVING FINAL SITE PLAN APPROVAL.

DOWNSPOUTS, WEEPTILE, FOOTING DRAINS, SUMP PUMP DISCHARGES OR ANY OTHER CONDUITS WHICH TRANSPORT STORM DRAINAGE OR GROUNDWATER SHALL NOT DISCHARGE TO THE SANITARY SEWER.

STORM SEWERS SHALL BE ASTM C76 REINFORCED CONCRETE PIPE WITH PREMIUM JOINTS, SPECIFIED IN ACCORDANCE WITH THE RUNOFF CALCULATIONS, DEPTH AND LOCATION OF THE SEWER.

MANHOLES AND CATCH BASINS SHALL BE PRECAST CONCRETE AND WATERTIGHT WITH A MINIMUM INSIDE DIAMETER OF 48" AND A 24" (MINIMUM) CLEAR OPENING. MANHOLE BLOCK IS PERMITTED ONLY WHERE PRECAST SECTIONS CANNOT BE USED.

STORM SEWER RUNOFF CALCULATIONS AND DETENTION CALCULATIONS SHALL BE PROVIDED IN ACCORDANCE WITH THE WASHTENAW COUNTY DRAIN COMMISSION STANDARDS AND GENERALLY ACCEPTED ENGINEERING PRACTICE.

SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW AND APPROVAL IN ACCORDANCE WITH TOWNSHIP STANDARDS.

RECORD DRAWINGS SHALL BE SUBMITTED TO THE TOWNSHIP UPON COMPLETION OF THE PROJECT. RECORD DRAWINGS SHALL BE SUBMITTED ON REPRODUCIBLE MYLAR.

PRIVATE EASEMENTS FOR PUBLIC STORM SEWERS SHALL BE PROVIDED TO THE TOWNSHIP IN THE SPECIFIED FORMAT UPON APPROVAL OF THE FINAL SITE PLAN.

**SUMP PUMPS**

HOUSES WITHIN THIS DEVELOPMENT ARE TO BE CONSTRUCTED WITH FOOTER TILE AND SHALL HAVE A SUMP PUMP WITH A CHECK VALVE INSTALLED. HOUSES ARE NOT DESIGNED FOR GRAVITY FLOW TO THE STORM SEWER.

THE FOLLOWING NOTES APPLY FOR UNIT 12 TO UNIT 48:

- A. ALL ROOF DRAINAGE MUST BE DIRECTED TO THE FRONT OF THE HOUSE OR TO THE FOOTING DRAINS.
- B. ALL FOOTING DRAINS MUST DRAIN TO A SUMP.
- C. SUMP PUMP FORCE MAIN MUST CONNECT TO THE 6-INCH GRAVITY STORM SEWER LEAD WHICH DISCHARGES TO THE STORM SYSTEM.
- D. ALL STORM SEWER LEADS MUST BE GRAVITY LINES AND A MINIMUM OF 6 INCHES IN DIAMETER.
- E. STORM SEWER LEAD MATERIAL MUST BE COLOR CODED TO BE UNIQUELY DIFFERENT FROM THE SANITARY SEWER SERVICE LEADS.
- F. STORM SEWER LEADS SHALL BE SDR 26 PVC MATERIAL.

\*SUMP PUMP LEADS OR ANY STORM SEWERS USED SOLELY TO DRAIN SUMP PUMPS SHALL NOT DIRECTLY CONNECT TO ANY WRCR OWNED STRUCTURES.

**ROADWAY**

ROADWAY CONSTRUCTION SHALL CONFORM TO THE WASHTENAW COUNTY ROAD COMMISSION STANDARDS AND SPECIFICATIONS. NO ROADWAY CONSTRUCTION SHALL COMMENCE UNTIL APPROVAL OF THE FINAL PLAN HAS BEEN RECEIVED FROM BOTH THE COUNTY AND THE TOWNSHIP.

TEST RESULTS OF PAVING SHALL BE PROVIDED THROUGH AN INDEPENDENT TESTING LABORATORY AND APPROVED BY THE ROAD COMMISSION ENGINEER BEFORE A CERTIFICATE OF OCCUPANCY IS ISSUED OR THE PERFORMANCE GUARANTEE IS RELEASED. TESTING OF THE SUBBASE AND PAVING SHALL BE PERFORMED IN ACCORDANCE WITH THE ROAD COMMISSION STANDARDS SPECIFICATIONS.

INTEGRAL CURB AND GUTTER CONFORMING TO MICHIGAN DEPARTMENT OF TRANSPORTATION TYPE D-2, AS MODIFIED BY THE WASHTENAW COUNTY ROAD COMMISSION, SHALL BE USED INTERIOR TO THE PROJECT. THE BOULEVARD ENTRANCE SHALL UTILIZE MICHIGAN DEPARTMENT OF TRANSPORTATION F-4 F-4 CURB AND GUTTER.

**SOIL EROSION AND SEDIMENTATION CONTROL**

SOIL EROSION AND SEDIMENTATION CONTROL SHALL ADHERE TO 1994 PA 451, PART 91 AS AMENDED, AND ALL OTHER APPLICABLE STANDARDS AND SPECIFICATIONS AS DEVELOPED AND ADMINISTERED BY THE CHARTER TOWNSHIP OF PITTSFIELD.

A NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT IS REQUIRED FOR THIS SITE UNDER ACT 245, PUBLIC ACTS OF 1929 AS AMENDED (STATE OF MICHIGAN WATER RESOURCES COMMISSION ACT). A NOTICE OF COVERAGE AND THE APPLICABLE FEE SHALL BE FILED WITH THE MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY UPON ISSUANCE OF THE SOIL EROSION PERMIT FROM THE TOWNSHIP.

AREAS TO BE SEEDDED SHALL BE FERTILIZED, SEEDDED AND MULCHED IN ACCORDANCE WITH MICHIGAN DEPARTMENT OF TRANSPORTATION SECTION 6.53. FERTILIZER, SEED MIXTURES AND MULCH SHALL MEET THE REQUIREMENTS OF MICHIGAN DEPARTMENT OF TRANSPORTATION SECTIONS 8.21.09, 8.21.10 AND 8.21.11, RESPECTIVELY. SEED MIXTURES SHALL FOLLOW THE COMPOSITIONS IN TABLE 8.21-1. CLASS A MIXTURE SHALL BE USED FOR RESTORATION OF EXISTING LAWNS. ROADSIDE MIXTURE SHALL BE USED FOR RESTORATION OF ALL OTHER DISTURBED AREAS. COMMERCIAL FERTILIZER (12-12-12) SHALL BE APPLIED AT THE RATE OF 20 POUNDS PER 1,000 SQUARE FEET. SEED SHALL BE APPLIED AT THE RATE OF THREE (3) POUNDS PER 1,000 SQUARE FEET. MULCH SHALL BE APPLIED AT THE RATE OF TWO (2) TONS PER ACRE.

IN THE EVENT MULCHING IS DISPLACED, IT SHALL BE REPLACED, BUT ONLY AFTER THE SEEDING AND OTHER WORK THAT PRECEDED THE MULCHING AND WHICH WORK WAS DAMAGED BECAUSE OF THE DISPLACEMENT OF THE MULCHING MATERIAL HAS BEEN ACCEPTABLY REPAIRED.

THE CONTRACTOR SHALL PROPERLY PROTECT AND CARE FOR ALL AREAS UNTIL THE GRASS IS OF A WELL ESTABLISHED DENSE UNIFORM GROWTH AT LEAST FOUR (4) INCHES HIGH. IF THE GRASS SHOWS A GOOD GROWTH AND A DENSE STAND AT THIS TIME, THE CONTRACTOR'S OBLIGATIONS SHALL HAVE BEEN FULFILLED EXCEPT FOR THE REPAIR OF FUTURE SETTLEMENT.

FOR ALL SEEDDED AREAS, ANY SPOTS THAT DO NOT SHOW A PROMPT "CATCH" SHALL BE RESEEDDED AT INTERVALS OF 21 DAYS, WHICH SHALL CONTINUE UNTIL A GOOD GROWTH IS ESTABLISHED OVER THE ENTIRE SEEDDED AREA. RENEWAL OR REPLACEMENT OF LAWN AREAS SHALL ADHERE TO THE SAME CRITERIA AS THE ORIGINAL SEEDING/MULCHING ACTIVITIES AS HEREIN SPECIFIED. AREAS DAMAGED DUE TO ACTS OF NEGLIGENCE BY RESIDENTS OR VANDALISM SHALL BE RESOWN ONLY AT THE REQUEST AND EXPENSE OF THE OWNER.

THE CALCULATED QUANTITY FOR SEEDING, FERTILIZING AND MULCHING INCLUDES ALL AREA WITHIN THE RIGHT-OF-WAY AND ALL DRAINAGE EASEMENTS. THE QUANTITY IS FOR ONE COMPLETE COVERAGE OF THE PROJECT AREA.

**CONSTRUCTION IN A DEVELOPED AREA**

ANY CONSTRUCTION AREA IN A PUBLIC RIGHT-OF-WAY OR EXISTING EASEMENT IS TO BE RESTORED AS GOOD OR BETTER THAN THE CONDITIONS WHICH EXISTED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL FAMILIARIZE HIMSELF WITH THESE AREAS AND SHALL DOCUMENT THE EXISTING CONDITIONS BY PHOTOS AND OTHER MEANS.

WHEN WORKING ADJACENT TO EXISTING RESIDENCES, THE CONTRACTOR SHALL NOT PERFORM CONSTRUCTION UPON NOR ALLOW EQUIPMENT TO ENTER UPON ADJACENT RESIDENCES WITHOUT WRITTEN APPROVAL FROM THE HOMEOWNER.

**MAILBOXES**

ALL MAILBOX MATERIALS, LOCATIONS, AND OTHER REQUIREMENTS SHALL MEET THE STANDARDS OF THE WASHTENAW COUNTY ROAD COMMISSION.

**LIGHTING**

A STREET LIGHTING SPECIAL ASSESSMENT DISTRICT SHALL BE APPLIED FOR BEFORE ANY BUILDING PERMITS ARE ISSUED. ALL DEVELOPER CONTRIBUTIONS SHALL BE PAID BEFORE ANY CERTIFICATE OF OCCUPANCY IS ISSUED.



AS-BUILT PLANS PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

3 WORKING DAYS  
BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
FOR FREE LOCATION OF PUBLIC UTILITIES

C.S.P.A. #96-22

REVISIONS	REVISIONS			ST. JAMES WOODS II	
	ITEM	DATE	BY		
	WRCR/TWP	7/25/03	GM	HOR 1" = 1'	FIELD BOOK NO.
	WRCR	5/22/03	GM		
2/20/07	TWP	5/07/03	GM	JOB NO. <b>00068</b>	SHEET NO. 2 OF 42
8/4/05	REV. (PITTSFIELD TWP.)	2/6/03	GM		
7/11/05	REVISION	11/25/02	KMD	E.P. KUBISKE & ASSOCIATES, INC. 1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734)481-1322 FAX (734)481-2215	
3/19/05	DRAINAGE AND GRADING REVISIONS	10/22/02	KMD		
1/17/05	REVISION	08/30/02	KMD		
8/2/04	REVISION	02/13/01	AKF		
3/31/04	DESIGNED BY	DATE	01/19/01		

# ST. JAMES WOODS II A PLANNED UNIT DEVELOPMENT

IN NW 1/4 SECTION 20, T3S, R6E,  
PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN



### NOTES

1. THE SITE IS APPROXIMATELY 69 ACRES LOCATED IN THE NW 1/4 OF SECTION 20, PITTSFIELD TOWNSHIP. SIGNIFICANT AMOUNTS OF WETLAND AREAS ARE PRESENT WHICH REQUIRE THE USE OF PUD ZONING.
2. SOILS ON THE SITE CONSIST OF BOYER LOAMY SAND (BnB), MATHERTON SANDY LOAM (Mda), WASEPI SANDY LOAM (WaA), ADRIAN MUCK (Ad), PALMS MUCK (Pa), AND SEBEWA LOAM (Sb). THE LATTER THREE (3) SOIL TYPES ARE CLASSIFIED AS HYDRIC SOILS AND TYPICALLY SUPPORT WETLAND-TYPE VEGETATION. SOIL IDENTIFICATION WAS TAKEN FROM THE WASHTENAW COUNTY SOIL SURVEY, U.S. DEPARTMENT OF AGRICULTURE, SOIL CONSERVATION SERVICE.
3. THE EBERBACH DRAIN IS A COUNTY DRAIN WHICH BISECTS THE PROPERTY FROM EAST TO WEST IN A 66 FOOT WIDE EASEMENT. THE DRAIN CONTINUES NORTHERLY ALONG LOHR ROAD IN THE EASTERLY DITCH WITHIN THE RIGHT-OF-WAY TO A POINT NORTH OF THE PROPERTY.
4. PUBLIC UTILITY LOCATION PER FIELD SURVEY BY G.L.A. SURVEY AND WEST SIDE UTILITIES PROJECT RECORD SET DRAWINGS FROM PITTSFIELD TOWNSHIP.
5. WETLAND BOUNDARY ESTABLISHED BY BROOKS WILLIAMSON AND ASSOCIATES IN DECEMBER, 1993 AND VERIFIED BY FIELD INVESTIGATION WITH RICK SCHRAMM OF MDEQ IN APRIL, 1994.
6. HYDRAULIC ANALYSIS OF THE SITE INDICATES A 100-YEAR FLOODPLAIN WHICH VARIES FROM 823.25 AT THE WEST PROPERTY LINE TO 822.30 AT THE EAST PROPERTY LINE.

### HISTORICAL LEGAL DESCRIPTION

THE WEST 50 ACRES OF THE NORTH 1/2 OF THE NORTHWEST 1/4 OF SECTION 20, T3S, R6E, PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN; ALSO THE NORTH 1/2 OF THE SOUTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 20, T3S, R6E, PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN, EXCEPTING THE FOLLOWING DESCRIBED PREMISES: COMMENCING AT THE SOUTHWEST CORNER OF THE NORTH 1/2 OF THE SOUTHWEST 1/4 OF THE NORTHWEST 1/4 OF SECTION 20, T3S, R6E; THENCE NORTH ALONG THE WEST LINE OF SAID SECTION 9 RODS; THENCE EAST PARALLEL TO THE SOUTH LINE OF SAID SECTION 9 RODS; THENCE SOUTH PARALLEL TO THE WEST LINE OF SAID SECTION 9 RODS; THENCE WEST 17.7 RODS TO THE POINT OF BEGINNING. ALSO EXCEPTING: BEGINNING ON THE WEST LINE OF THE NORTH WEST 1/4 OF SECTION 20, T3S, R6E AT A POINT 9 RODS NORTH OF THE SOUTHWEST CORNER OF THE NORTH 1/2 OF THE SOUTHWEST 1/4 OF THE NORTHWEST 1/4 OF SAID SECTION 20; THENCE NORTH ALONG SAID WEST LINE 8.5 FEET; THENCE EAST PARALLEL TO THE SOUTH LINE OF SAID NORTH 1/2, 17.7 RODS; THENCE SOUTH PARALLEL TO THE WEST LINE OF SAID SECTION 8.5 FEET; THENCE WEST PARALLEL TO SAID SOUTH LINE 17.7 RODS TO THE POINT OF BEGINNING.

### LEGEND

- = TREELINE
- - - = FENCE
- 825 = EXISTING CONTOUR
- ⊙ TB-10 = SOIL BORING LOCATION
- - - = 100-YEAR FLOODPLAIN (PER HYDRAULIC STUDY)
- MdA = SOIL TYPE DELINEATION
- Sb = DRAINAGE AREA BOUNDARY
- = DRAINAGE PATTERN ARROW
- [Pattern] = ADRIAN MUCK (Ad)
- [Pattern] = PALMS MUCK (Pa)
- [Pattern] = SEBEWA LOAM (Sb)
- [Pattern] = BOYER LOAMY SAND (BnB)
- [Pattern] = MATHERTON SANDY LOAM (Mda)
- [Pattern] = WASEPI SANDY LOAM (WaA)
- [Pattern] = WETLANDS

NOTE: STORM WATER MANAGEMENT PLAN RETAINS ALL STORM WATER TRIBUTARY TO WETLANDS IN CONSTRUCTED RETENTION POND.



AS-BUILT PLANS PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

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C.S.P.A. #96-22

ST. JAMES WOODS

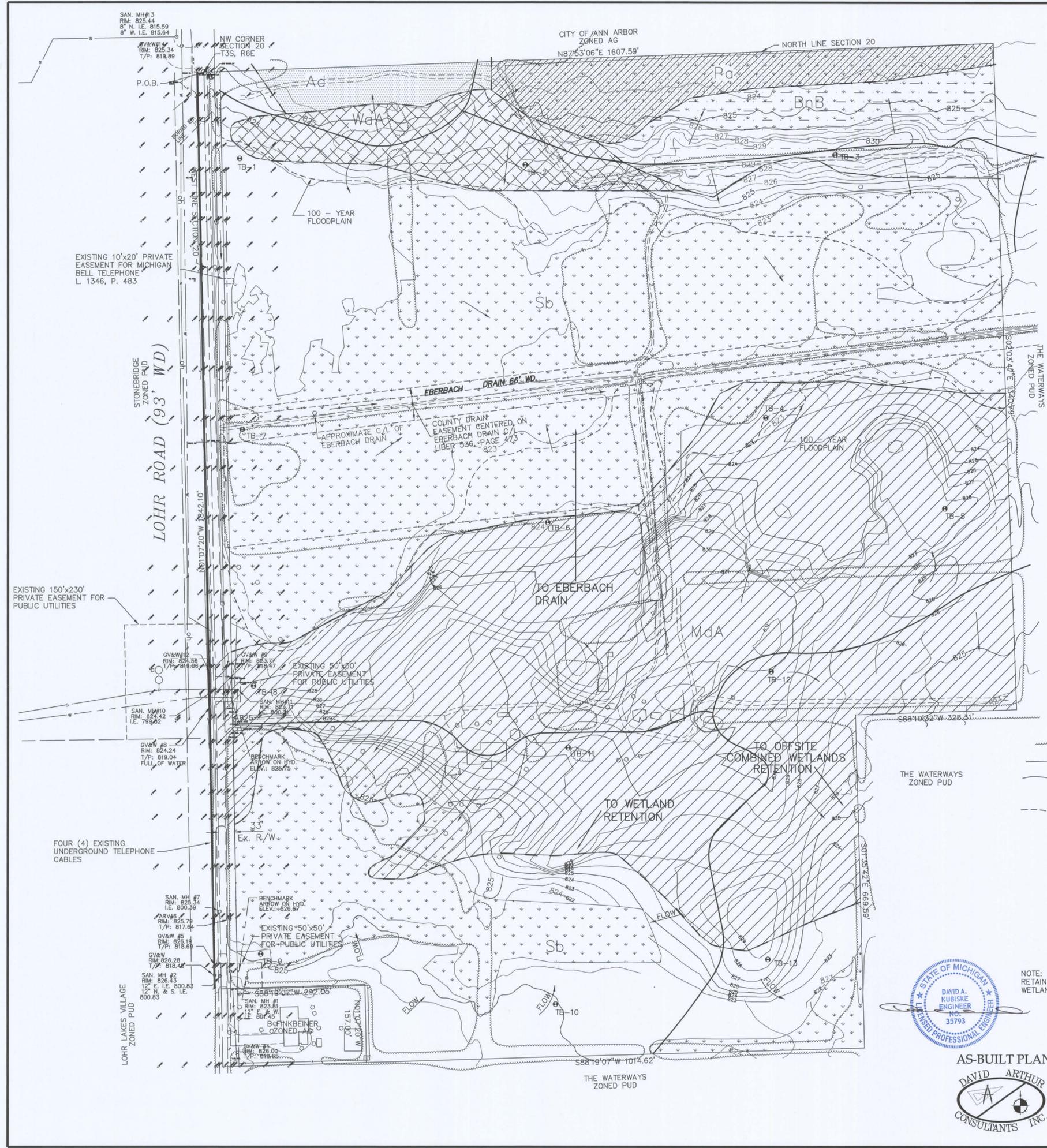
EXISTING CONDITIONS

E.P. KUBISKE & ASSOCIATES, INC.

1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

REVISIONS	ITEM	DATE	BY
	WRCR/TWP	7/25/03	GM
	WRCR	5/22/03	GM
	TWP	5/07/03	GM
2/20/07	GM	REV (PITTSFIELD TWP.)	2/6/03 GM
8/4/05	GM	REVISION	11/25/02 KMD
7/11/05	GM	DRAINAGE AND GRADING REVISIONS	10/22/02 KMD
3/18/05	GM	REVISION	08/30/02 KMD
1/17/05	GM	REVISION	08/13/02 KMD
8/2/04	GM	REVISION	08/13/02 KMD
3/31/04	GM	DESIGNED BY	DATE 02/13/01

SCALE	SHEET NO.
HOR 1" = 100'	00068
VER 1" =	
FIELD BOOK NO.	
JOB NO.	
SHEET NO.	5 OF 42



SAN. MH #13  
RIM: 825.44  
8" N. I.E. 815.59  
8" W. I.E. 815.64

NW CORNER  
SECTION 20  
T3S, R6E

CITY OF ANN ARBOR  
ZONED AG  
N87°53'06"E 1607.59'

NORTH LINE SECTION 20

100 - YEAR  
FLOODPLAIN

EXISTING 10'x20'  
PRIVATE EASEMENT FOR MICHIGAN  
BELL TELEPHONE  
L. 1346, P. 483

LOHR ROAD (93' WD)

EBERBACH DRAIN 66' WD

APPROXIMATE C/L OF  
EBERBACH DRAIN

COUNTY DRAIN  
EASEMENT CENTERED ON  
EBERBACH DRAIN C/L  
LIBER 536 PAGE 473

100 - YEAR  
FLOODPLAIN

EXISTING 150'x230'  
PRIVATE EASEMENT FOR  
PUBLIC UTILITIES

EXISTING 50'x50'  
PRIVATE EASEMENT  
FOR PUBLIC UTILITIES

TO EBERBACH  
DRAIN

TO OFFSITE  
COMBINED WETLANDS  
RETENTION

TO WETLAND  
RETENTION

THE WATERWAYS  
ZONED PUD

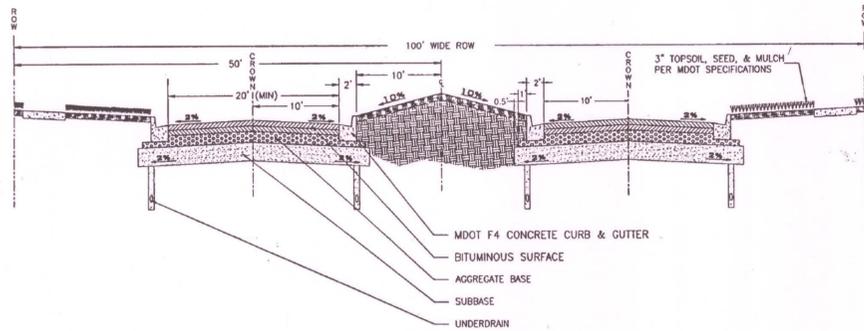
FOUR (4) EXISTING  
UNDERGROUND TELEPHONE  
CABLES

EXISTING 50'x50'  
PRIVATE EASEMENT  
FOR PUBLIC UTILITIES

LOHR LAKES VILLAGE  
ZONED PUD

THE WATERWAYS  
ZONED PUD

## BITUMINOUS PAVEMENT CROSS-SECTIONS



TYPICAL URBAN LOCAL BOULEVARD - 100' ROW

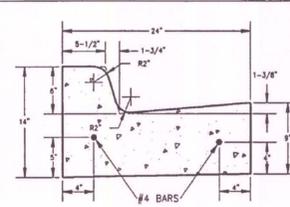


BLVD b

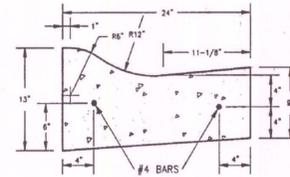
SCALE: N.T.S.

NOTE:  
ONLY F4 AND D2  
CURBS ARE USED.  
(ON-SITE)

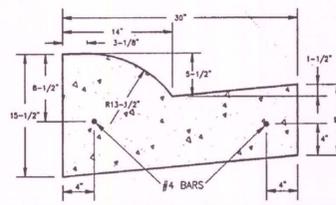
## CURB & GUTTER CROSS-SECTIONS



MDOT F4 BARRIER  
CONCRETE CURB &  
GUTTER .  
REQUIRES E.J.I.W.  
7045 OR NEENAH  
R-3031-B CASTING



MDOT D2 (MODIFIED)  
MOUNTABLE  
CONCRETE CURB &  
GUTTER .  
REQUIRES E.J.I.W.  
7065 OR NEENAH  
R-3034-B CASTING



MDOT B2  
MOUNTABLE  
CONCRETE CURB  
& GUTTER .  
REQUIRES E.J.I.W.  
7085 OR NEENAH  
R-3038-A CASTING

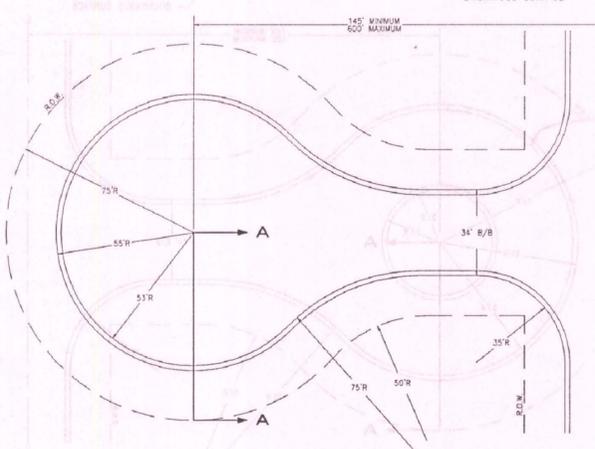
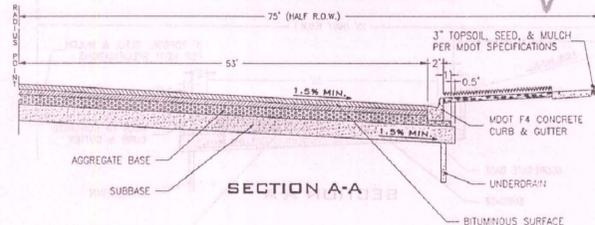
TYPICAL CURB & GUTTER  
CROSS-SECTION DETAILS



CURB

SCALE: N.T.S.

## CUL-DE-SAC DETAILS



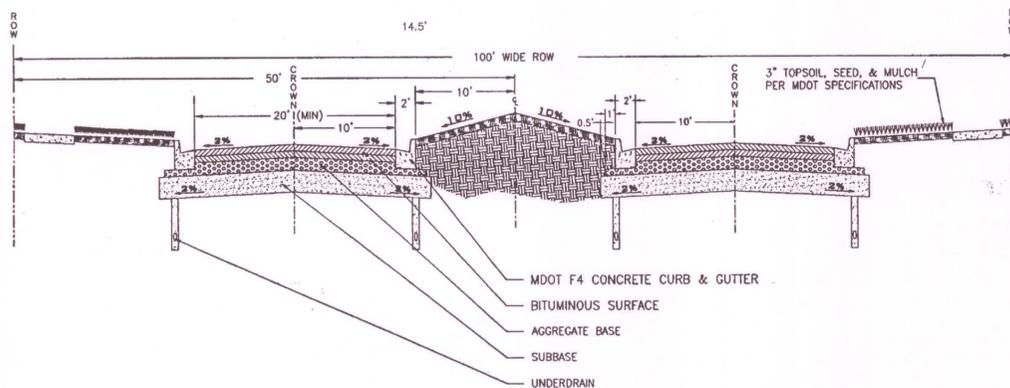
TYPICAL URBAN CUL-DE-SAC  
WITHOUT ISLAND



CUL u

SCALE: N.T.S.

## BITUMINOUS PAVEMENT CROSS-SECTIONS



TYPICAL URBAN LOCAL BOULEVARD - 100' ROW



BLVD b

SCALE: N.T.S.

## GENERAL SUMMARY

QUANTITY	UNIT	DESCRIPTION
ROADWAY		
1	LUMP	CLEARING & GRUBBING
1	LUMP	EARTH WORK
1	LUMP	SOIL EROSION AND SEDIMENTATION CONTROL, AS PER PLAN
129900	SQ. YD.	SEEDING, MULCHING AND FERTILIZATION
1	LUMP	TRAFFIC CONTROL
PAVEMENT		
539	CU.YD.	1 1/2" BITUMINOUS CONCRETE WEARING COURSE, MDOT 13
539	CU.YD.	1 1/2" BITUMINOUS CONCRETE LEVELING COURSE, MDOT 13
2298	CU.YD.	6" AGGREGATE BASE, MDOT SPEC. 22A
2640	CU. YD.	6" GRANULAR SUBBASE, MDOT CLASS II
6403	LIN. FT.	4" SUBBASE UNDERDRAIN
994	LIN. FT.	CONCRETE CURB, MDOT TYPE F-4
6403	LIN. FT.	CONCRETE CURB, MDOT TYPE D-2 (MODIFIED)
407	CU.YD.	5' CONCRETE SIDEWALK, 4" THICK, MDOT 35P
719	CU.YD.	2" BITUMINOUS BASE MDOT 11A
DRAINAGE		
2257	LIN. FT.	6" SUMP LEAD, PVC SDR 26 (ALL OUTSIDE R-O-W)
1504	LIN. FT.	12" SEWER, ASTM C-76, CL IV RCP
1611	LIN. FT.	15" SEWER, ASTM C-76, CL IV RCP
657	LIN. FT.	18" SEWER, ASTM C-76, CL IV RCP
490	LIN. FT.	24" SEWER, ASTM C-76, CL IV RCP
142	LIN. FT.	27" SEWER, ASTM C-76, CL IV RCP
569	LIN. FT.	30" SEWER, ASTM C-76, CL IV RCP
5	EACH	2' PRECAST INLET
16	EACH	4' PRECAST CATCH BASIN
2	EACH	6' PRECAST CATCH BASIN
9	EACH	4' PRECAST MANHOLE
6	EACH	6' PRECAST MANHOLE
7	EACH	12" END SECTION, CSP
8	EACH	15" END SECTION
2	EACH	18" END SECTION
1	EACH	30" END SECTION
3	EACH	STORMCEPTORS
SANITARY SEWER		
2846	LIN. FT.	6" SEWER LEAD, PVC SDR 26
3152	LIN. FT.	8" SEWER, SDR 26 PVC
15	EACH	4' PRECAST SANITARY MANHOLE
WATERLINE		
3674	LIN. FT.	1" TYPE 'K' COPPER LEAD W/ CURB STOP AND BOX
1178	LIN. FT.	8" WATER MAIN, CLASS 54 DUCTILE IRON W/ DOUBLE CEMENT LINING
1984	LIN. FT.	12" WATER MAIN, CLASS 54 DUCTILE IRON W/ DOUBLE CEMENT LINING
5	EACH	8" GATE VALVE
6	EACH	12" GATE VALVE
5	EACH	5' GATE WELL
6	EACH	6' GATE WELL
11	EACH	STANDARD HYDRANT ASSEMBLY
11	EACH	12"x12"x6" TEE
5	EACH	12"x12"x8" TEE

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD  
MEASURED / AS-BUILT  
INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

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C.S.P.A. #96-9



REVISIONS	DATE	BY
	7/25/03	GM
	5/22/03	GM
	5/07/03	GM
2/20/07		GM
8/4/05		GM
7/11/05		GM
3/18/05		KMD
1/17/05		KMD
8/2/04		KMD
3/31/04		AKF

ST. JAMES WOODS II  
GENERAL SUMMARY  
& TYPICAL SECTIONS

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 1"  
VER 1" = 1"  
JOB NO. 00068  
SHEET NO. 3 OF 42



ST. JAMES WOODS II  
A PLANNED UNIT DEVELOPMENT  
IN THE NW 1/4 SECTION 20, T3S, R6E,  
PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

**LOT SIZE & FLOOR ELEVATION TABLE**

NO.	SIZE (S.F.)	SIZE (AC.)	F.F. ELEV.	B.F. ELEV.	TYPE	NO.	SIZE (S.F.)	SIZE (AC.)	F.F. ELEV.	B.F. ELEV.	TYPE
12	20777	0.48	834.00	824.50	VIEWOUT	37	16652	0.38	834.30	824.80	VIEWOUT
13	20351	0.47	835.00	825.50	VIEWOUT	38	13209	0.30	834.30	824.80	VIEWOUT
14	23131	0.53	835.00	825.50	VIEWOUT	39	13209	0.30	834.30	824.80	VIEWOUT
15	23916	0.55	835.00	825.50	VIEWOUT	40	13209	0.30	834.30	824.80	VIEWOUT
16	24280	0.56	835.00	825.50	WALKOUT	41	13949	0.32	834.30	824.80	VIEWOUT
17	27050	0.62	833.50	824.00	VIEWOUT	42	18716	0.43	833.00	823.50	STANDARD
18	20395	0.47	833.50	824.00	STANDARD	43	20025	0.46	833.50	824.00	STANDARD
19	20058	0.46	834.00	824.50	STANDARD	44	20096	0.46	833.50	824.00	STANDARD
20	20300	0.47	834.30	824.80	VIEWOUT	45	20019	0.46	833.50	824.00	STANDARD
21	20009	0.46	834.30	824.80	VIEWOUT	46	24407	0.56	833.50	824.00	VIEWOUT
22	20683	0.47	834.30	824.80	STANDARD	47	18888	0.43	833.50	824.00	WALKOUT
23	20022	0.46	834.30	824.80	STANDARD	48	24012	0.55	833.50	824.00	VIEWOUT
24	20176	0.46	833.30	823.80	STANDARD	49	23129	0.53	833.50	824.00	VIEWOUT
25	20042	0.46	833.20	823.70	STANDARD	50	20352	0.47	833.50	824.00	VIEWOUT
26	22234	0.51	835.30	825.80	WALKOUT	51	20054	0.46	833.50	824.00	STANDARD
27	20361	0.47	835.30	825.80	WALKOUT	52	20088	0.46	833.50	824.00	STANDARD
28	26473	0.61	835.10	825.60	STANDARD	53	20076	0.46	833.50	824.00	VIEWOUT
29	20105	0.46	834.40	824.90	STANDARD	54	20021	0.46	833.50	824.00	VIEWOUT
30	20478	0.47	833.50	824.00	VIEWOUT	55	22338	0.51	833.50	824.00	VIEWOUT
31	20001	0.46	833.10	823.60	VIEWOUT	56	26190	0.60	833.50	824.00	VIEWOUT
32	20249	0.46	833.10	823.60	STANDARD	57	20106	0.46	833.50	824.00	VIEWOUT
33	30741	0.71	835.10	825.60	VIEWOUT	58	20137	0.46	833.50	824.00	VIEWOUT
34	20024	0.46	835.10	825.60	VIEWOUT	59	18000	0.41	833.50	824.00	WALKOUT
35	22787	0.52	835.10	825.60	VIEWOUT	60	18193	0.42	833.50	824.00	WALKOUT
36	20149	0.46	835.10	825.60	VIEWOUT	61	18470	0.42	833.50	824.00	WALKOUT

**LEGAL DESCRIPTION**

DESCRIPTION OF ST. JAMES WOODS BEING PART OF THE NORTHWEST 1/4 OF SECTION 20, TOWN 3 SOUTH, RANGE 6 EAST, PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN:

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 20, THENCE N.87°53'06"E. 1607.59 FEET ALONG THE NORTH LINE OF SAID SECTION 20; THENCE S.02°03'47"E. 582.31 FEET TO THE APPROXIMATE CENTERLINE OF THE EBERBACH DRAIN AS LOCATED IN THE FIELD; THENCE SOUTHWESTERLY ALONG THE APPROXIMATE CENTERLINE OF THE EBERBACH DRAIN S.83°07'41"W 1564.97 FEET TO THE CENTERLINE OF LOHR ROAD; THENCE N.01°07'20"W. 717.18 FEET ALONG THE WEST LINE OF SAID SECTION 20, ALSO BEING THE CENTERLINE OF LOHR ROAD TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THE WESTERLY 60 FEET THEREOF FOR LOHR ROAD, BEING A PART OF THE NORTHWEST 1/4 OF SAID SECTION 20, AND CONTAINING 24.06 ACRES OF LAND, MORE OR LESS.

**PHASE I**

BEGINNING AT THE NORTHWEST CORNER OF SAID SECTION 20; THENCE N.87°53'06"E. 1607.59 FEET ALONG THE NORTH LINE OF SAID SECTION 20; THENCE S.02°03'47"E. 582.31 FEET TO THE APPROXIMATE CENTERLINE OF THE EBERBACH DRAIN AS LOCATED IN THE FIELD; THENCE SOUTHWESTERLY ALONG THE APPROXIMATE CENTERLINE OF THE EBERBACH DRAIN S.83°07'41"W 1564.97 FEET TO THE CENTERLINE OF LOHR ROAD; THENCE N.01°07'20"W. 717.18 FEET ALONG THE WEST LINE OF SAID SECTION 20, ALSO BEING THE CENTERLINE OF LOHR ROAD TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THE WESTERLY 60 FEET THEREOF FOR LOHR ROAD, BEING A PART OF THE NORTHWEST 1/4 OF SAID SECTION 20, AND CONTAINING 24.06 ACRES OF LAND, MORE OR LESS.

**PHASE II**

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 20; THENCE S.01°07'20"E. 717.18 FEET ALONG THE WEST LINE OF SAID SECTION 20, ALSO BEING THE CENTERLINE OF LOHR ROAD FOR A PLACE OF BEGINNING; THENCE NORTHEASTERLY ALONG THE APPROXIMATE CENTERLINE OF THE EBERBACH DRAIN N.83°07'41"E. 1564.97 FEET; THENCE S.02°03'47"E. 758.48 FEET; THENCE S.88°10'32"W. 328.31 FEET; THENCE S.01°35'42"E. 669.59 FEET; THENCE S.88°19'07"W. 1014.62 FEET; THENCE N.01°07'20"W. 157.00 FEET; THENCE S.88°19'07"W. 292.05 FEET; THENCE N.01°07'20"W. 1124.92 FEET ALONG SAID WEST LINE AND SAID CENTERLINE OF LOHR ROAD TO THE PLACE OF BEGINNING, EXCEPTING THEREFROM THE WESTERLY 60 FEET THEREOF FOR LOHR ROAD, BEING A PART OF THE NORTHWEST 1/4 OF SAID SECTION 20 AND CONTAINING 44.55 ACRES OF LAND, MORE OR LESS.

**CURVE TABLE**

CURVE NO.	LENGTH	RADIUS	Δ	CHORD
①	60.21'	230.00'	15°00'00"	S.83°37'19"E. 60.04'
②	62.11'	230.00'	15°28'22"	S.83°51'31"E. 61.92'
③	229.35'	250.00'	52°33'47"	N.24°41'11"E. 221.39'
④	148.40'	230.00'	36°58'08"	N.69°27'09"E. 145.84'

- SEE SHEETS 8-10 FOR DETAILED SURVEY AND GEOMETRIC PLAN.
- STREETS SHALL BE GENERAL COMMON ELEMENTS WITH EASEMENTS GRANTED TO WASHTENAW COUNTY ROAD COMMISSION FOR PUBLIC USE AND MAINTENANCE.
- ALL AREAS OUTSIDE LIMITS OF OWNERSHIP SHALL BE GENERAL COMMON ELEMENTS, INCLUDING THE DETENTION POND AND WETLAND MITIGATION AREA.

**LEGEND**

- = WETLAND DISTURBANCE WITHIN UNIT
- = WETLANDS
- = LIMITS OF OWNERSHIP



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

C.S.P.A. #96-22

REVISIONS		REVISIONS		
DATE	BY	ITEM	DATE	BY
2/20/07	GM	WCRC/TWP	7/25/03	GM
8/4/05	GM	WCRC	5/22/03	GM
7/11/05	GM	TWP	5/07/03	GM
4/26/05	GM	REV (PITTSFIELD TWP.)	2/6/03	GM
3/18/05	GM	REVISION	11/25/02	KMD
1/17/05	GM	UNRAVE AND GRADING REVISIONS	10/22/02	KMD
8/2/04	GM	REVISION	08/30/02	KMD
3/31/04	GM	REVISION	08/13/02	KMD

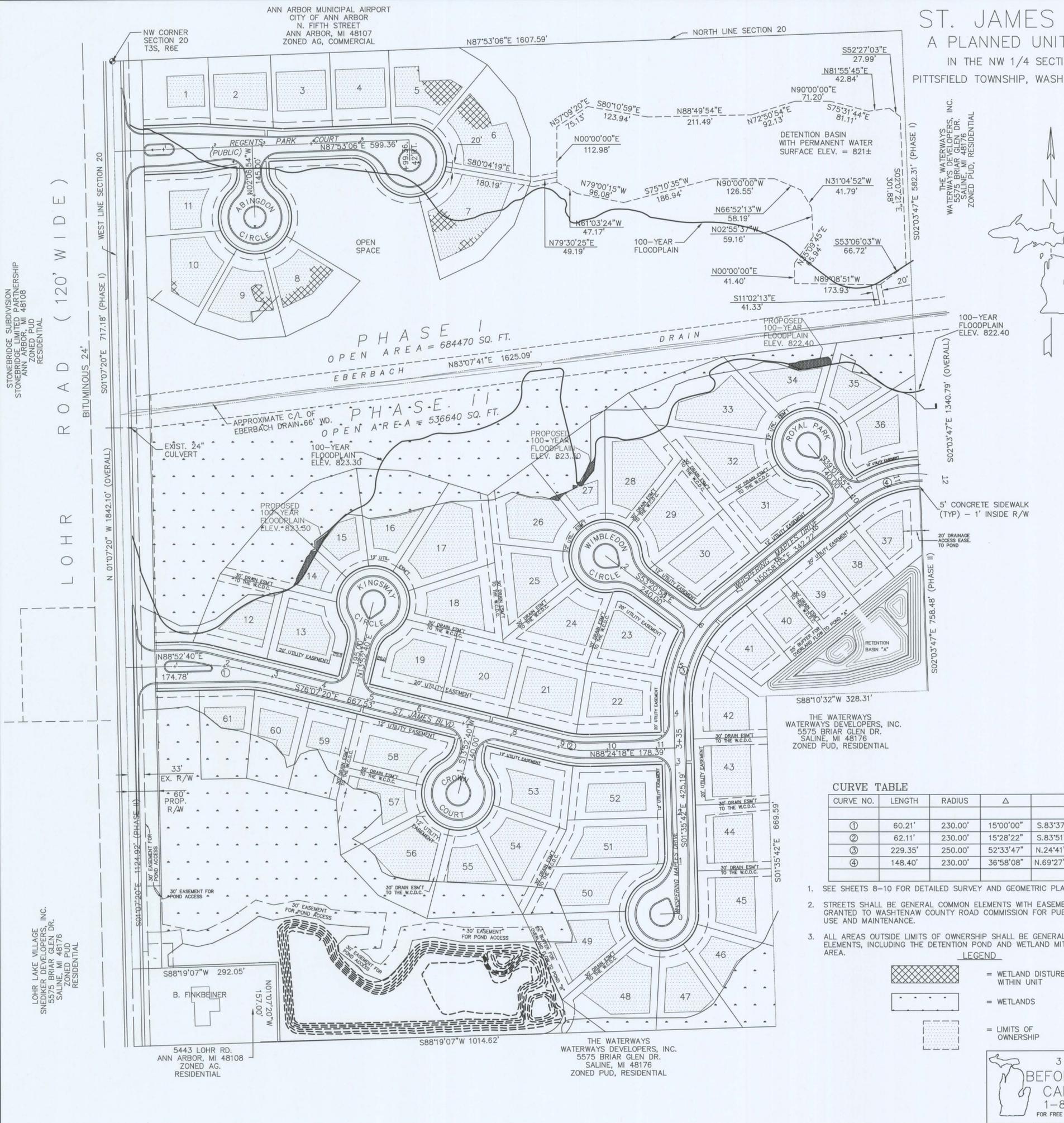
**ST. JAMES WOODS II**

**OVERALL SURVEY & GEOMETRIC PLAN**

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 100'  
VER 1" = 10'  
FIELD BOOK NO.  
JOB NO.  
00068  
SHEET NO.  
7 OF 42

3 WORKING DAYS  
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FOR FREE LOCATION OF PUBLIC UTILITIES



ANN ARBOR MUNICIPAL AIRPORT  
CITY OF ANN ARBOR  
N. FIFTH STREET  
ANN ARBOR, MI 48107  
ZONED AG, COMMERCIAL

STONERIDGE SUBDIVISION  
STONERIDGE LIMITED PARTNERSHIP  
ANN ARBOR, MI 48108  
ZONED PUD  
RESIDENTIAL

LOHR ROAD (120' WIDE)  
BITUMINOUS 24"  
N 01°07'20" W 1842.10' (OVERALL)  
S 01°07'20" E 717.18' (PHASE I)

PHASE I  
OPEN AREA = 684470 SQ. FT.

PHASE II  
OPEN AREA = 536640 SQ. FT.

THE WATERWAYS DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD, RESIDENTIAL

THE WATERWAYS DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD, RESIDENTIAL

THE WATERWAYS DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD, RESIDENTIAL

LOHR LAKE VILLAGE  
SNEDEKER DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD  
RESIDENTIAL

ANN ARBOR, MI 48108  
ZONED AG, COMMERCIAL  
RESIDENTIAL

ANN ARBOR, MI 48108  
ZONED AG, COMMERCIAL  
RESIDENTIAL

ST. JAMES WOODS II  
 A PLANNED UNIT DEVELOPMENT  
 IN THE NW 1/4 SECTION 20, T3S, R6E,  
 PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN



PROPOSED  
 100-YEAR  
 FLOODPLAIN  
 ELEV. 822.40

100-YEAR  
 FLOODPLAIN  
 823.30

PROPOSED  
 100-YEAR  
 FLOODPLAIN  
 ELEV. 823.30

NOTES

- ALL ROADS SHALL BE GENERAL COMMON ELEMENTS WITH EASEMENTS DEDICATED TO THE WASHTENAW COUNTY ROAD COMMISSION FOR PUBLIC USE AND MAINTENANCE.

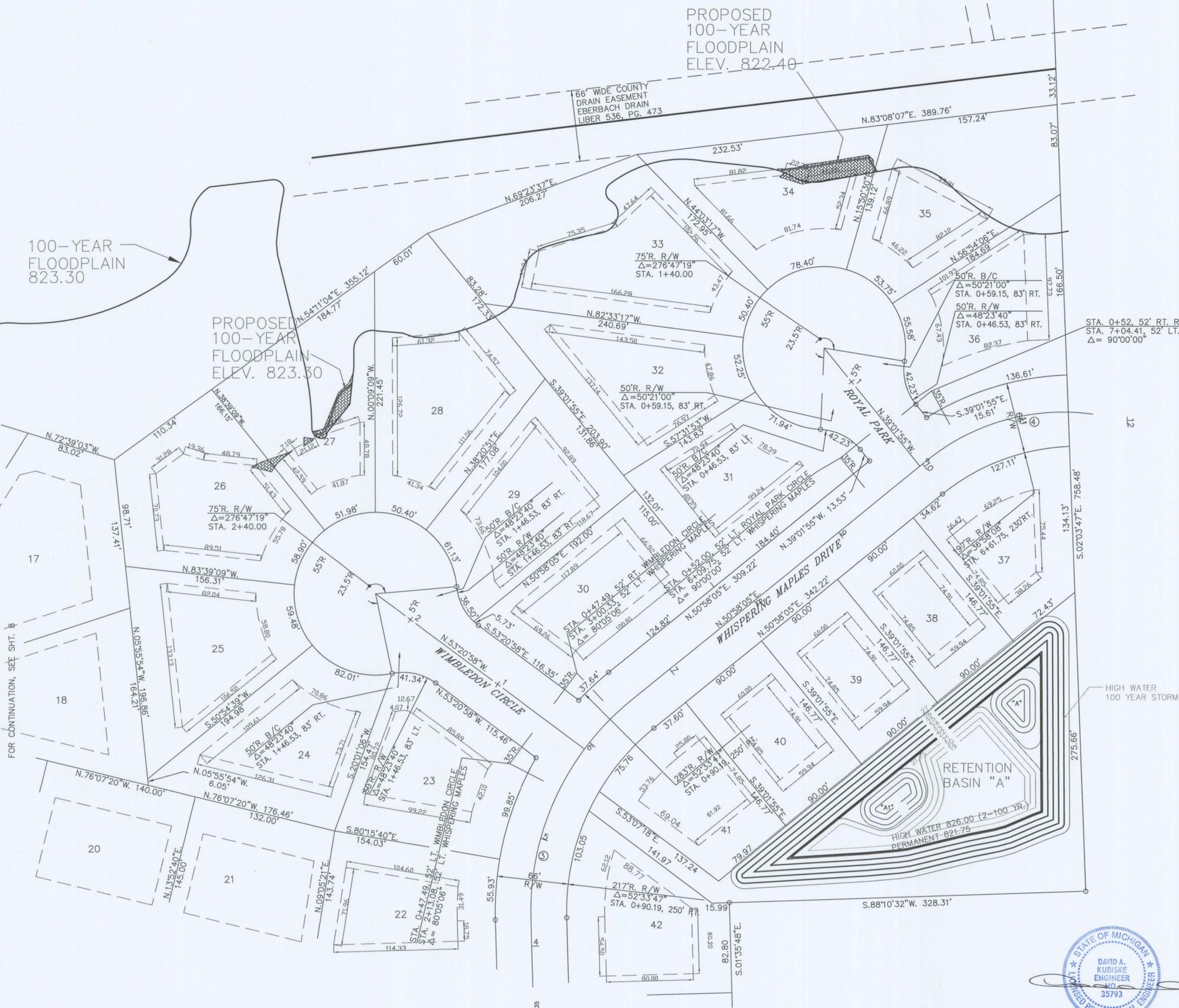
LEGEND

- WETLAND DISTURBANCE WITHIN UNIT
- MONUMENT TO BE SET
- SETBACK
- LOT LINE

CURVE TABLE

CURVE NO.	LENGTH	RADIUS	Δ	CHORD
③	229.35'	250.00'	52°33'47"	N.24°41'11"E. 221.39'
④	148.40'	230.00'	36°58'08"	N.69°27'09"E. 145.84'

SEE SHEET 8 FOR LOT SIZE AND FLOOR ELEVATION TABLE



**AS-BUILT**  
 THIS SHEET DOES NOT  
 CONTAIN FIELD MEASURED /  
 AS-BUILT INFORMATION

3 WORKING DAYS  
 BEFORE YOU DIG  
 CALL MISS DIG  
 1-800-482-7171  
 FOR FREE LOCATION OF PUBLIC UTILITIES

C.S.P.A. #96-22



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
 CONSULTANTS INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

REVISIONS	ITEM	DATE	BY
	WRCR/TWP	7/25/03	GM
	WRCR	5/22/03	GM
2/20/07	TWP	5/07/03	GM
8/4/05	REV (PITTSFIELD TWP)	2/6/03	GM
7/11/05	REVISION	11/25/02	KMD
3/18/05	DRAINAGE AND GRADING REVISIONS	10/22/02	KMD
1/17/04	REVISION	08/30/02	KMD
8/2/04	REVISION	08/13/02	KMD
3/31/04	DRAIN BY	DESIGNED BY	DATE
	KMD		06/19/02

ST. JAMES WOODS II

SURVEY & GEOMETRIC PLAN  
 WHISPERING MAPLES DRIVE NORTH,  
 WIMBLETON CIRCLE AND ROYAL PARK CIRCLE

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734) 481-1322  
 FAX (734) 481-2215

SCALE  
 HOR 1" = 50'  
 VER 1" = 10'

FIELD BOOK NO.  
 JOB NO.  
**00068**  
 SHEET NO.  
 9 OF 42

ST. JAMES WOODS II  
A PLANNED UNIT DEVELOPMENT  
IN THE NW 1/4 SECTION 20, T3S, R6E,  
PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN



NOTES

- ALL ROADS SHALL BE GENERAL COMMON ELEMENTS WITH EASEMENTS DEDICATED TO THE WASHTENAW COUNTY ROAD COMMISSION FOR PUBLIC USE AND MAINTENANCE.

LEGEND

- WETLAND DISTURBANCE WITHIN UNIT
- MONUMENT TO BE SET
- SETBACK
- LOT LINE

CURVE TABLE

CURVE NO.	LENGTH	RADIUS	Δ	CHORD
①	60.21'	230.00'	15°00'00"	S.83°37'19"E. 60.04'
②	62.11'	230.00'	15°28'22"	S.83°51'31"E. 61.92'

LOT SIZE & FLOOR ELEVATION TABLE

NO.	SIZE (S.F.)	SIZE (AC.)	F.F. ELEV.	B.F. ELEV.	TYPE	NO.	SIZE (S.F.)	SIZE (AC.)	F.F. ELEV.	B.F. ELEV.	TYPE
12	20777	0.48	834.00	824.50	VIEWOUT	37	16652	0.38	834.30	824.80	VIEWOUT
13	20351	0.47	835.00	825.50	VIEWOUT	38	13209	0.30	834.30	824.80	VIEWOUT
14	23131	0.53	835.00	825.50	VIEWOUT	39	13209	0.30	834.30	824.80	VIEWOUT
15	23916	0.55	835.00	825.50	VIEWOUT	40	13209	0.30	834.30	824.80	VIEWOUT
16	24280	0.56	833.00	825.50	WALKOUT	41	13949	0.32	834.30	824.80	VIEWOUT
17	27050	0.62	833.50	824.00	VIEWOUT	42	18716	0.43	833.00	823.50	STANDARD
18	20395	0.47	833.50	824.00	STANDARD	43	20025	0.46	833.50	824.00	STANDARD
19	20058	0.46	834.00	824.50	STANDARD	44	20096	0.46	833.50	824.00	STANDARD
20	20300	0.47	834.30	824.80	VIEWOUT	45	20019	0.46	833.50	824.00	STANDARD
21	20009	0.46	834.30	824.80	VIEWOUT	46	24407	0.56	833.50	824.00	VIEWOUT
22	20683	0.47	834.30	824.80	STANDARD	47	18888	0.43	833.50	824.00	WALKOUT
23	20022	0.46	834.30	824.80	STANDARD	48	24012	0.55	833.50	824.00	VIEWOUT
24	20176	0.46	833.30	823.80	STANDARD	49	23129	0.53	833.50	824.00	VIEWOUT
25	20042	0.46	833.20	823.70	STANDARD	50	20352	0.47	833.50	824.00	VIEWOUT
26	22234	0.51	835.30	825.80	WALKOUT	51	20054	0.46	833.50	824.00	STANDARD
27	20361	0.47	835.30	825.80	WALKOUT	52	20088	0.46	833.50	824.00	STANDARD
28	28473	0.61	835.10	825.60	STANDARD	53	20076	0.46	833.50	824.00	VIEWOUT
29	20105	0.46	834.40	824.90	STANDARD	54	20021	0.46	833.50	824.00	VIEWOUT
30	20478	0.47	833.50	824.00	VIEWOUT	55	22338	0.51	833.50	824.00	VIEWOUT
31	20001	0.46	833.10	823.60	VIEWOUT	56	26190	0.60	833.50	824.00	VIEWOUT
32	20249	0.46	833.10	823.60	STANDARD	57	20106	0.46	833.50	824.00	VIEWOUT
33	30741	0.71	835.10	825.60	VIEWOUT	58	20137	0.46	833.50	824.00	VIEWOUT
34	20024	0.46	835.10	825.60	VIEWOUT	59	18000	0.41	833.50	824.00	WALKOUT
35	22787	0.52	835.10	825.60	VIEWOUT	60	18193	0.42	833.50	824.00	WALKOUT
36	20149	0.46	835.10	825.60	VIEWOUT	61	18470	0.42	833.50	824.00	WALKOUT



AS-BUILT PLANS PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

3 WORKING DAYS  
BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
FOR FREE LOCATION OF PUBLIC UTILITIES

C.S.P.A. #96-22

REVISIONS	REVISIONS	REVISIONS	REVISIONS
NO.	DATE	BY	DESCRIPTION
	7/25/03	GM	WRCR/TWP
	5/22/03	GM	WRCR
2/20/07	5/07/03	GM	TWP
8/4/05	2/8/03	GM	REV (PITTSFIELD TWP.)
7/11/05	11/25/02	KMD	REVISION
3/18/05	10/22/02	KMD	REVISION
1/17/05	08/30/02	KMD	REVISION
8/2/04	08/13/02	KMD	REVISION
3/31/04	09/19/02	KMD	DESIGNED

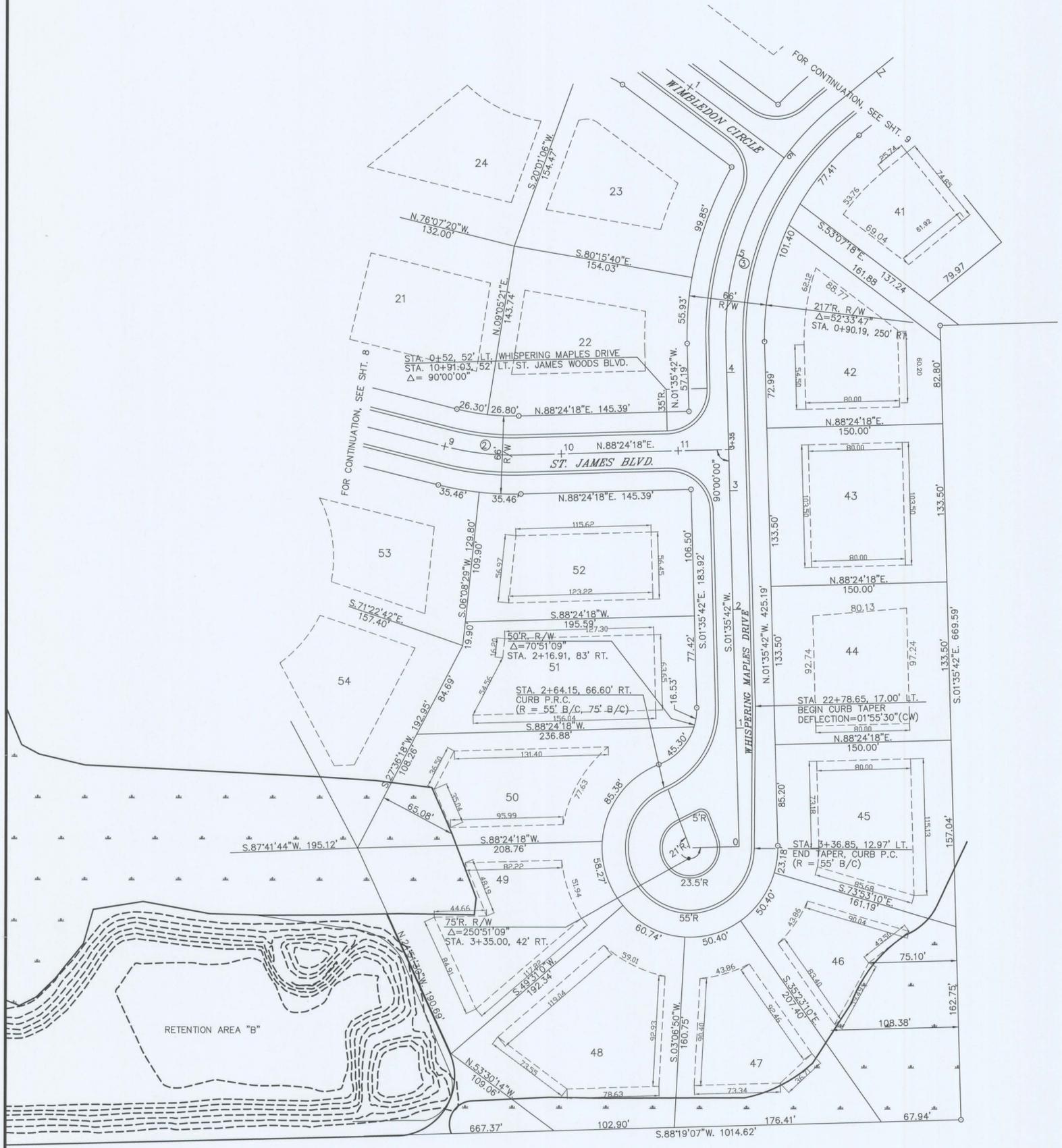
ST. JAMES WOODS II

SURVEY & GEOMETRIC PLAN  
ST. JAMES WOODS BLVD., KINGSWAY  
CIRCLE AND CROWN COURT CIRCLE

E.P. KUBSKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-9908  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE: 1" = 50'  
JOB NO. 00068  
SHEET NO. 8 OF 42

ST. JAMES WOODS II  
 A PLANNED UNIT DEVELOPMENT  
 IN THE NW 1/4 SECTION 20, T3S, R6E,  
 PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN



NOTES

- ALL ROADS SHALL BE GENERAL COMMON ELEMENTS WITH EASEMENTS DEDICATED TO THE WASHTENAW COUNTY ROAD COMMISSION FOR PUBLIC USE AND MAINTENANCE.

CURVE TABLE

CURVE NO.	LENGTH	RADIUS	Δ	CHORD
②	62.11'	230.00'	15°28'22"	S.83°51'31"E.. 61.92'
③	229.35'	250.00'	52°33'47"	N.24°41'11"E. 221.39'

SEE SHEET 8 FOR LOT SIZE AND FLOOR ELEVATION TABLE

LEGEND

- WETLAND DISTURBANCE WITHIN UNIT
- MONUMENT TO BE SET
- SETBACK
- LOT LINE

**AS-BUILT**  
 THIS SHEET DOES NOT  
 CONTAIN FIELD MEASURED /  
 AS-BUILT INFORMATION

3 WORKING DAYS  
 BEFORE YOU DIG  
 CALL MISS DIG  
 1-800-482-7171  
 FOR FREE LOCATION OF PUBLIC UTILITIES

C.S.P.A. #96-22



AS-BUILT PLANS PREPARED BY:  
 DAVID ARTHUR CONSULTANTS INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

REVISIONS	REVISIONS	DATE	BY
	ITEM		
	WCRC/TWP	7/25/03	GM
	WCRC	5/22/03	GM
	TWP	5/07/03	GM
2/20/07	GM	REV. (PITTSFIELD TWP.)	2/6/03 GM
8/4/05	GM	REVISION	11/25/02 KMD
7/11/05	GM	DRAINAGE AND GRADING REVISIONS	10/22/02 KMD
3/18/05	GM	REVISION	08/30/02 KMD
1/17/05	GM	REVISION	08/13/02 KMD
8/2/04	GM	DESIGNED BY	DATE
3/31/04	GM	KMD	06/15/02

ST. JAMES WOODS II  
 SURVEY & GEOMETRIC PLAN  
 WHISPERING MAPLES DRIVE

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734)481-1322  
 FAX (734)481-2215

SCALE  
 HOR 1" = 50'  
 VER 1" = 10'  
 FIELD BOOK NO.  
 JOB NO.  
 00068  
 SHEET NO.  
 10 OF 42



POND "A":  
 C(comp)=0.58  
 VOL. (req)=33,000X5.854AC.X0.58=112046  
 VOL.(BANKFULL)=2.25'(1/12)(43560)(5.854)(0.58)=27,731 CU.FT.  
 ELEVATION @ BANKFULL  
 (823-822)/(39467-18547)=(X-822)/(39467-27731), X=822.56

RETENTION BASIN "A"

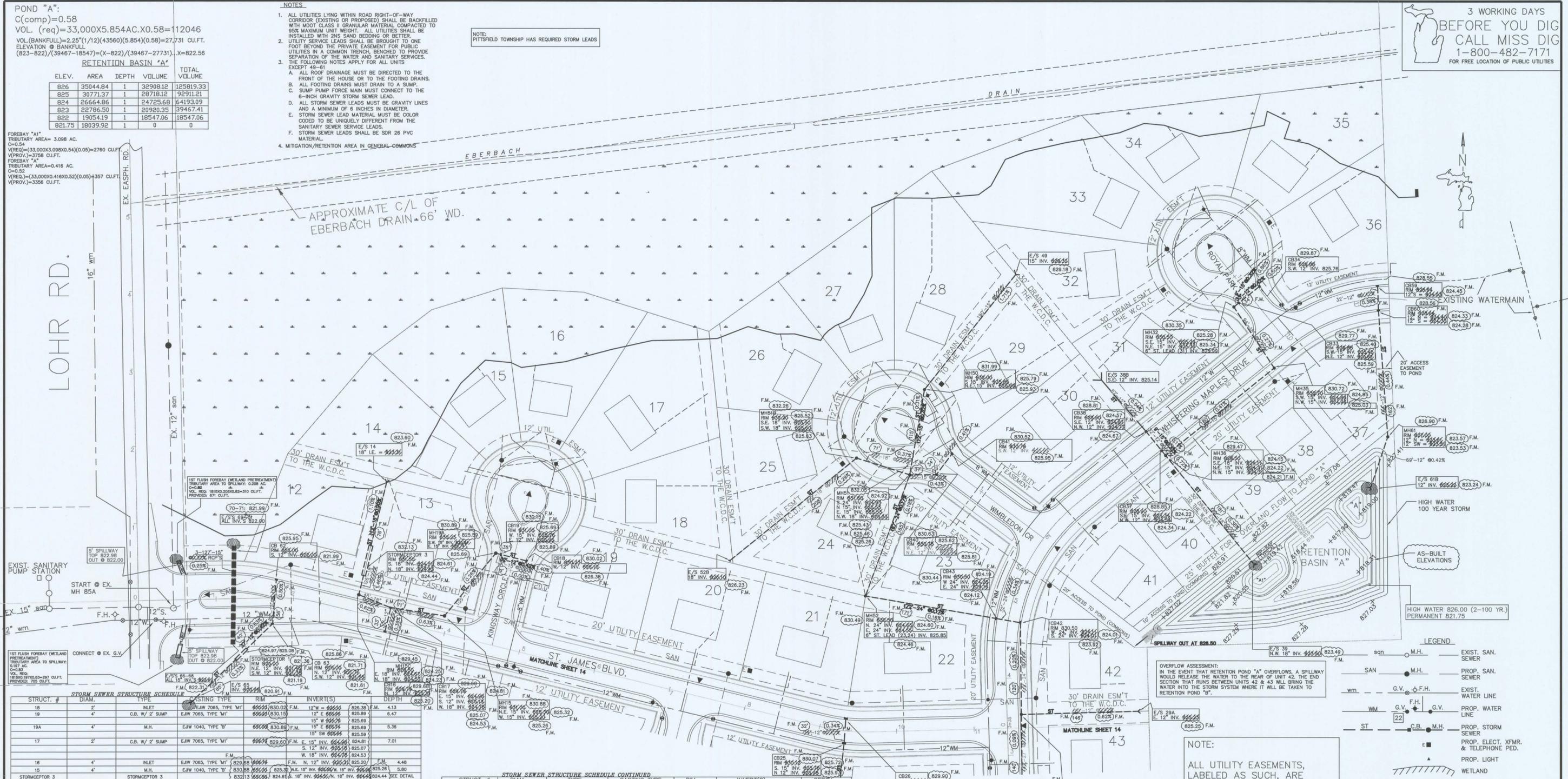
ELEV.	AREA	DEPTH	VOLUME	TOTAL VOLUME
826	35044.84	1	32908.12	125819.33
825	30771.37	1	28716.12	92911.21
824	2664.86	1	24725.68	64193.09
823	22796.50	1	20920.35	39467.41
822	19054.19	1	18547.06	18547.06
821.75	18039.92	1	0	0

FOREBAY "A1"  
 TRIBUTARY AREA= 3.098 AC.  
 C=0.54  
 V(REQ)=(33,000X3.098X0.54)(0.05)=2760 CU.FT.  
 V(PROV)=3758 CU.FT.  
 FOREBAY "A"  
 TRIBUTARY AREA=0.416 AC.  
 C=0.52  
 V(REQ)=(33,000X0.416X0.52)(0.05)=357 CU.FT.  
 V(PROV)=3356 CU.FT.

- NOTES:
- ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MOOT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 2NS SAND BEDDING OR BETTER.
  - UTILITY SERVICE LEADS SHALL BE BROUGHT TO ONE FOOT BEYOND THE PRIVATE EASEMENT FOR PUBLIC UTILITIES IN A COMMON TRENCH, BENDED TO PROVIDE SEPARATION OF THE WATER AND SANITARY SERVICES.
  - THE FOLLOWING NOTES APPLY FOR ALL UNITS EXCEPT 49-51:
    - ALL ROOF DRAINAGE MUST BE DIRECTED TO THE FRONT OF THE HOUSE OR TO THE FOOTING DRAINS.
    - ALL FOOTING DRAINS MUST DRAIN TO A SUMP.
    - SUMP PUMP FORCE MAIN MUST CONNECT TO THE 6-INCH GRAVITY STORM SEWER LEAD.
    - ALL STORM SEWER LEADS MUST BE GRAVITY LINES AND A MINIMUM OF 6 INCHES IN DIAMETER.
    - STORM SEWER LEAD MATERIAL MUST BE COLOR CODED TO BE UNIQUELY DIFFERENT FROM THE SANITARY SEWER SERVICE LEADS.
    - STORM SEWER LEADS SHALL BE SDR 26 PVC MATERIAL.
  - MITIGATION/RETENTION AREA IN GENERAL-COMMONS

NOTE: PITTSFIELD TOWNSHIP HAS REQUIRED STORM LEADS

3 WORKING DAYS  
 BEFORE YOU DIG  
 CALL MISS DIG  
 1-800-482-7171  
 FOR FREE LOCATION OF PUBLIC UTILITIES



STORM SEWER STRUCTURE SCHEDULE

STRUCT. #	DIAM.	TYPE	CASTING TYPE	RIM	INVERT(S)	DEPTH
18	2'	INLET	EJW 7065, TYPE 'M'	825.02	F.M. 12"E = 825.02	4.13
19	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. 12"E = 825.02	6.47
19A	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. 15"E = 825.02	5.36
17	2'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. 15" SW = 825.02	7.01
16	4'	INLET	EJW 7065, TYPE 'M'	825.02	F.M. N. 12" INV. = 825.02	4.48
15	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. N.E. 15" INV. = 825.02	5.80
STORMCEPTOR 3	4'	STORMCEPTOR 3		825.02	F.M. S. 12" INV. = 825.02	SEE DETAIL
15C	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. E. 12" INV. = 825.02	4.93
E/S 14	18"	END SECTION		825.02	F.M. 18" I.E. = 825.02	
49	18"	END SECTION		825.02	F.M. 15" I.E. = 825.02	
50	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. S. 15" INV. = 825.02	6.11
41	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. SW 12" INV. = 825.02	6.81
40	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. W. 15" INV. = 825.02	7.14
51	6'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. N.E. 15" INV. = 825.02	6.67
51B	6'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. S.E. 18" INV. = 825.02	6.70
52B	18"	END SECTION		825.02	F.M. S.W. 18" INV. = 825.02	
52	6'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. 6" ST. LEAD (23.24) INV. = 825.02	5.92
43	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. W. 24" INV. = 825.02	8.34
42	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. E. 24" INV. = 825.02	8.49
29A	6'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. N. 24" INV. = 825.02	8.02
29D	12"	END SECTION		825.02	F.M. E. 12" INV. = 825.02	
30	2'	INLET	EJW 7065, TYPE 'M'	825.02	F.M. E. 12" INV. = 825.02	5.77
29	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. N. 27" INV. = 825.02	9.10
29E	12"	END SECTION		825.02	F.M. S. 30" INV. = 825.02	
MH29B	6'	M.H.	EJW 140, TYPE 'B'	825.02	F.M. N. 30" INV. = 825.02	8.28
29C	12"	END SECTION		825.02	F.M. E. 12" INV. = 825.02	
28	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. E/S 12" INV. = 825.02	9.12
27A	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. N.E. 30" INV. = 825.02	10.49
45	30"	END SECTION		825.02	F.M. S.W. 30" INV. = 825.02	

STORM SEWER STRUCTURE SCHEDULE CONTINUED

STRUCT. #	DIAM.	TYPE	CASTING TYPE	RIM	INVERT(S)	DEPTH
38B	12"	END SECTION		825.02	F.M. S.E. 12" INV. = 825.02	
38	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S.E. 12" INV. = 825.02	6.23
37	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. N.W. 12" INV. = 825.02	6.56
34	2'	INLET	EJW 7065, TYPE 'M'	825.02	F.M. SW 12" INV. = 825.02	4.12
33	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S.W. 15" INV. = 825.02	6.46
32	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. S.E. 15" INV. = 825.02	5.21
35	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. S.W. 15" INV. = 825.02	5.81
36	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. N.W. 15" INV. = 825.02	5.39
39	21"	END SECTION		825.02	F.M. N.W. 15" INV. = 825.02	
59	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S. 12" INV. = 825.02	6.01
60	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S. 12" INV. = 825.02	6.24
81	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. N. 12" INV. = 825.02	3.49
61B	12"	END SECTION		825.02	F.M. 12" I.E. = 825.02	
26	6'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S. 12" INV. = 825.02	6.01
25	6'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. N. 12" INV. = 825.02	6.34
53	6'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. S. 15" INV. = 825.02	8.48
54	15"	END SECTION		825.02	F.M. 15" INV. = 825.02	
66	15"	END SECTION		825.02	F.M. 822.31	
67	15"	END SECTION		825.02	F.M. 822.31	
68	15"	END SECTION		825.02	F.M. 822.31	
70	15"	END SECTION		825.02	F.M. 822.31	
69	15"	END SECTION		825.02	F.M. 822.31	
71	15"	END SECTION		825.02	F.M. 822.31	

AS-BUILT  
 1/16/09  
 REVISED 2/23/09

AS-BUILT LEGEND  
 ORIGINAL CONSTRUCTION  
 PLAN DESIGN

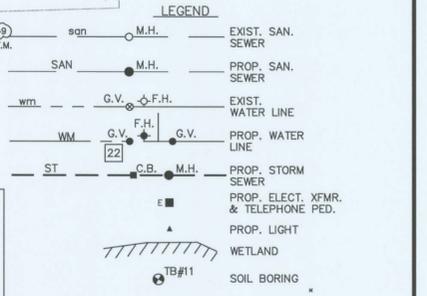
AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:  
 DAVID ARTHUR CONSULTANTS, INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

STORM SEWER STRUCTURE SCHEDULE CONTINUED

STRUCT. #	DIAM.	TYPE	CASTING TYPE	RIM	INVERT(S)	DEPTH
23	2'	INLET	EJW 7065, TYPE 'M'	825.02	F.M. 12"E = 825.02	4.74
22	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. 12"W = 825.02	7.02
21	4'	M.H.	EJW 1040, TYPE 'B'	825.02	F.M. 12"W = 825.02	5.93
STORMCEPTOR 2		STORMCEPTOR 2		825.02	F.M. N.E. 12" INV. = 825.02	SEE DETAIL
44	12"	END SECTION		825.02	F.M. 12" INV. = 825.02	
62	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. S. 12" INV. = 825.02	6.01
63	4'	C.B. W/ 2' SUMP	EJW 7065, TYPE 'M'	825.02	F.M. N. 12" INV. = 825.02	6.34
STORMCEPTOR 1	12"	STORMCEPTOR 1		825.02	F.M. N.E. 12" INV. = 825.02	SEE DETAIL
65	12"	END SECTION		825.02	F.M. 12" I.E. = 825.02	

NOTE:  
 ALL UTILITY EASEMENTS, LABELED AS SUCH, ARE FRANCHISE UTILITY EASEMENTS FOR GAS, PHONE, ELEC. AND/OR CABLE



REVISIONS

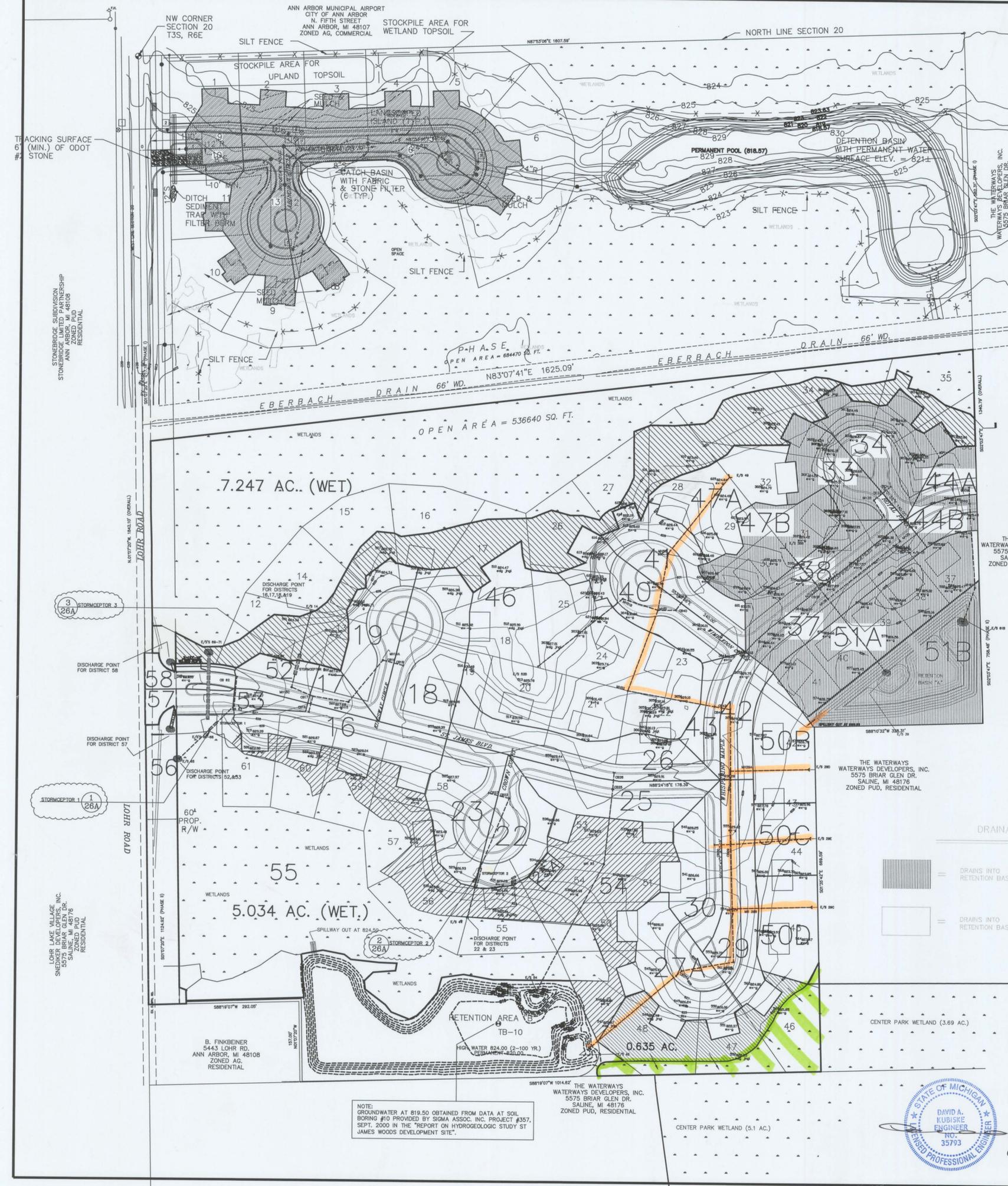
REVISIONS	ITEM	DATE	BY
2/20/07	WCR/WTP	7/25/03	GM
8/4/05	WCR	5/22/03	GM
7/11/05	TWP	5/07/03	GM
4/26/05	REVISION	2/6/03	GM
3/18/05	REVISION	11/25/02	KMD
1/17/05	REVISION	10/30/02	KMD
8/2/04	REVISION	10/22/02	KMD
3/31/04	REVISION	08/30/02	KMD

ST. JAMES WOODS II  
 STORM PLAN  
 E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-9906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734) 481-1322  
 FAX (734) 481-2215

SCALE  
 HOR 1" = 60'  
 VER 1" = 10'

JOB NO.  
 00068

SHEET NO.  
 13 OF 42



DISTRICT DATA  
SOILS: NORTHERLY SECTION MIAMI CLASS C  
SOUTHERLY SECTION SIBWA CLASS B/D  
ASSUME CLASS B FOR PROJECT C=0.35

DISTRICT #	TOTAL AREA AC.	OPEN(C=0.35) AC.	DEVELOPED(C=0.95) AC.	EQUIV. AREA AC.	C(comp)
42	0.34	0.22	0.13	0.19	0.56
43	0.32	0.19	0.13	0.19	0.56
44	0.59	0.491	0.288	0.327	0.58
26	0.841	0.590	0.251	0.445	0.53
25	0.105	0.021	0.084	0.087	0.83
25	0.716	0.450	0.315	0.440	0.62
30	0.584	0.450	0.315	0.440	0.62
30	0.867	0.540	0.327	0.580	0.58
506	0.568	0.486	0.082	0.248	0.44
500	0.387	0.330	0.057	0.170	0.44
500	0.467	0.385	0.082	0.213	0.46
52	0.240	0.162	0.078	0.115	0.59
46	2.665	2.302	0.363	0.131	0.53
41	0.683	0.428	0.255	0.382	0.57
41	0.683	0.428	0.255	0.382	0.57
44A	0.801	0.642	0.159	0.287	0.56
44A	2.476	2.124	0.352	0.118	0.54
55	5.411	5.411	0.000	0.376	0.47
25	0.777	0.543	0.234	0.412	0.43
57	0.197	0.041	0.156	0.163	0.83
58	0.208	0.044	0.164	0.171	0.82
17	0.164	0.099	0.065	0.096	0.59
18	0.928	0.679	0.249	0.318	0.53
18	0.928	0.679	0.249	0.318	0.53
33	0.530	0.345	0.185	0.287	0.56
34	0.778	0.457	0.321	0.465	0.60
44A	0.216	0.149	0.067	0.118	0.54
16	0.822	0.379	0.443	0.498	0.62
23	0.679	0.491	0.188	0.353	0.51
38	0.51	0.31	0.20	0.30	0.59
47B	0.88	0.67	0.21	0.30	0.59
44B	0.20	0.15	0.05	0.10	0.50
37	0.60	0.42	0.18	0.32	0.53
51A	1.18	1.80	0.38	0.28	0.80
51B	1.16	0.35	0.81	0.93	0.80
25A	0.055	0.055	0.055	0.052	0.95

HIGH WATER RETENTION "B" = 2.150 AC. C=1.00

DESIGN FOR STORM SEWER SYSTEMS

FROM	TO	INCREMENTS	C FACTOR	EQUIV. AREA AC.	TOTAL AREA AC.	TIME MIN	I IN/HR	Q=CIA CFS	CAPACITY CFS	DIAM. IN.	LENGTH FT.	SLOPE %	VELOCITY FT/SEC.	TIME MIN.	HYD. GRADE		
CB18	CB19	0.928	0.51	0.473	0.473	20	3.89	3.07	3.2	12	34	0.42	3.0	0.18	0.65		
CB19	MH18A	0.602	0.53	0.319	0.792	20.19	3.87	3.07	3.2	15	105	0.32	3.0	0.18	0.65		
MH18A	MH15	0.792	0.53	0.319	0.792	20.19	3.87	3.07	3.2	15	105	0.32	3.0	0.18	0.65		
MH15	CB17	0.896	0.62	0.500	0.792	20.19	3.87	3.07	3.2	15	105	0.32	3.0	0.18	0.65		
CB17	CB17	0.896	0.62	0.500	0.792	20.19	3.87	3.07	3.2	15	105	0.32	3.0	0.18	0.65		
CB17	MH15C	0.184	0.59	0.097	1.389	21.20	3.79	1.945	2.4	12	32	0.42	3.0	0.18	0.65		
MH15C	SIMCEP3	0.184	0.59	0.097	1.389	21.20	3.79	1.945	2.4	12	32	0.42	3.0	0.18	0.65		
SIMCEP3	ES14	0.801	0.47	0.376	1.389	21.20	3.79	5.24	5.6	18	45	0.24	3.0	0.25	1.14		
ES14	MH50	0.801	0.47	0.376	1.389	21.20	3.79	5.24	5.6	18	45	0.24	3.0	0.25	1.14		
MH50	MH51	0.801	0.47	0.376	1.389	21.20	3.79	5.24	5.6	18	45	0.24	3.0	0.25	1.14		
MH51	CB40	0.683	0.57	0.389	0.770	20.18	3.89	1.48	3.4	12	32	0.42	3.0	0.18	0.65		
CB40	MH51	0.683	0.57	0.389	0.770	20.18	3.89	1.48	3.4	12	32	0.42	3.0	0.18	0.65		
MH51	MH52	2.666	0.43	1.150	1.150	20	3.89	4.47	5.8	18	210	0.24	3.0	0.17	0.81		
ES22B	MH51B	2.666	0.43	1.150	1.150	20	3.89	4.47	5.8	18	210	0.24	3.0	0.17	0.81		
MH51B	MH51	0.381	0.58	0.224	1.150	21.08	3.77	8.66	9.8	24	167	0.17	3.0	0.53	1.48		
MH51	MH52	0.32	0.59	0.19	2.296	21.48	3.69	8.47	9.6	24	172	0.17	3.0	0.53	1.48		
CB43	CB42	0.32	0.59	0.19	2.486	23.37	3.62	9.00	9.6	24	32	0.17	3.0	0.18	1.54		
CB42	MH29A	0.34	0.56	0.190	2.676	23.49	3.61	9.66	9.6	24	119	0.18	3.0	0.62	1.60		
ES22A	MH29A	0.568	0.44	0.248	0.248	20	3.89	0.97	2.4	12	151	0.42	3.0	0.79	1.62		
MH29A	CB29	0.387	0.44	0.170	0.170	20	3.89	0.96	2.4	12	142	0.42	3.0	0.85	0.37		
ES29B	CB29	0.387	0.44	0.170	0.170	20	3.89	0.96	2.4	12	142	0.42	3.0	0.85	0.37		
CB29	CB29	0.584	0.59	0.345	0.345	20	3.89	1.34	2.4	12	32	0.42	3.0	0.18	0.65		
ES29C	MH29B	0.467	0.32	0.33	3.769	24.90	3.51	13.23	15.0	30	125	0.12	3.0	0.69	1.80		
MH29B	MH26	0.467	0.32	0.33	3.882	26.59	3.46	13.78	15.0	30	153	0.42	3.0	0.85	0.42		
MH26	CB27A	0.867	0.58	0.503	3.882	26.17	3.42	15.62	15.0	30	102	0.12	3.0	0.57	1.85		
CB27A	ES45	0.867	0.58	0.503	4.488	26.74	3.38	15.16	15.2	30	238	0.14	3.2	1.32	2.03		
ES45	CB28	0.641	0.53	0.446	0.446	20	3.89	1.74	2.4	12	31	0.42	3.0	0.17	0.84		
CB28	MH53	0.716	0.62	0.444	0.690	20.17	3.87	3.44	10.1	15	747	2.49	8.3	0.30	0.51		
MH53	ES54	0.055	0.95	0.052	0.942	20.47	3.85	3.83	3.8	15	278	0.32	3.0	1.94	0.96		
ES54	CB33	0.778	0.60	0.467	0.467	20	3.89	1.82	2.4	12	33	0.42	3.0	0.18	0.65		
CB33	MH32	0.530	0.56	0.297	0.764	20.18	3.87	2.96	3.8	15	94	0.32	3.0	0.05	0.83		
MH32	MH35	0.530	0.56	0.297	0.764	20.18	3.87	2.96	3.8	15	94	0.32	3.0	0.05	0.83		
MH35	MH36	0.88	0.44	0.30	0.30	20.75	3.83	2.93	3.8	15	181	0.32	3.0	1.01	0.81		
ES38B	CB38	0.88	0.44	0.30	0.30	20.75	3.83	2.93	3.8	15	181	0.32	3.0	1.01	0.81		
CB38	CB37	0.51	0.50	0.30	0.50	20.48	3.85	2.31	2.4	12	87	0.42	3.0	0.48	0.50		
CB37	MH36	0.60	0.53	0.32	0.92	20.68	3.83	3.52	3.4	12	97	0.32	3.0	0.18	0.77		
MH36	ES39	0.216	0.54	0.117	1.684	21.76	3.74	6.30	6.40	18	180	0.34	3.5	0.85	2.00		
ES39	CB60	0.216	0.54	0.117	0.216	20	3.89	0.455	2.4	12	32	0.42	3.0	0.18	0.65		
CB60	MH61	0.20	0.50	0.10	0.217	20.18	3.87	0.840	2.4	12	68	0.42	3.0	0.38	0.42		
MH61	ES61B	0.52	0.52	0.353	0.217	21.09	3.80	0.825	2.4	12	184	0.42	3.0	0.91	0.42		
ES61B	CB22	0.52	0.51	0.286	0.353	20.23	3.87	0.825	2.4	12	68	0.42	3.0	0.38	0.42		
CB22	SIMCEP2	0.52	0.51	0.286	0.353	20.23	3.87	0.825	2.4	12	68	0.42	3.0	0.38	0.42		
SIMCEP2	VOR20	0.52	0.51	0.286	0.353	20.23	3.87	0.825	2.4	12	68	0.42	3.0	0.38	0.42		
VOR20	CB22	0.52	0.51	0.286	0.353	20.23	3.87	0.825	2.4	12	68	0.42	3.0	0.38	0.42		
CB22	CB23	0.240	0.55	0.132	0.132	20	3.89	0.513	2.4	12	57	0.42	3.0	0.32	0.32		
CB23	SIMCEP1	0.105	0.61	0.087	0.219	20.32	3.85	0.845	2.4	12	47	0.42	3.0	0.26	0.42		
SIMCEP1	ES 65	0.219	0.61	0.087	0.219	20.58	3.84	0.841	2.4	12	80	0.42	3.0	0.44	0.42		
ES 65	ES70-73	10.209	0.41	4.190	4.190	20	3.89	16.30	6.599	9.7	11.4	3-15'	127	0.32	3.0	0.44	0.42

NOTE: FOR STORMCEPTOR SPECIFICS, SEE PAGE 26A

STORMCEPTOR TABLE

STORMCEPTOR #	PRODUCT #	MAIN PIPE DIA.	TREAT. FLOW RATE	INLET FLOW RATE	INLET STUB DIA.	OUTLET STUB DIA.
1	3620WQA00 CUSTOM	36"	0.84 CFS	0.845 CFS	12"	12"
2	4240WQA00	42"	3.66 CFS	2.40 CFS	12"	12"
3	6040WQA00 CUSTOM	60"	5.24 CFS	5.24 CFS	18"	18"

PHASE DRAIN DISTRICTS

AREA NUMBER	AREA (A.C.)	ASPH ROOF CONC. C=0.95	SOIL C=0.35	C
5	1.207	0.491	0.716	0.59
6	0.441	0.254	0.187	0.70
9	0.225	0.113	0.112	0.65
10	0.139	0.078	0.091	0.69
12	0.342	0.199	0.143	0.70
13	0.760	0.427	0.333	0.69

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



ST. JAMES WOODS II  
DRAINAGE AREA MAP

SCALE: HOR 1" = 100'  
VER 1" = 100'

FIELD BOOK NO. 00068  
JOB NO. 00068  
E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

REVISIONS

REVISIONS	DATE	BY
9/05/08	LAB	ITEM
8/28/08	LAB	WCRC/TWP
8/7/08	MDK	WCRC
2/20/07	GM	TWP
3/23/06	GM	REVISION
7/11/05	GM	REVISION
3/18/05	GM	REVISION
1/17/05	GM	REVISION
8/2/04	GM	REVISION
3/31/04	GM	REVISION

DESIGNED BY: 08/13/02

CSPA#96-22

STONERIDGE SUBDIVISION  
STONERIDGE LIMITED PARTNERSHIP  
ANN ARBOR, MI 48106  
ZONED PUD, RESIDENTIAL

ANN ARBOR MUNICIPAL AIRPORT  
CITY OF ANN ARBOR  
N. FIFTH STREET  
ANN ARBOR, MI 48107  
ZONED AG, COMMERCIAL

THE WATERWAYS DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD, RESIDENTIAL

B. FINKBEINER  
5443 LOHR RD.  
ANN ARBOR, MI 48108  
ZONED AG, RESIDENTIAL

THE WATERWAYS DEVELOPERS, INC.  
5575 BRIAR GLEN DR.  
SALINE, MI 48176  
ZONED PUD, RESIDENTIAL

DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

DAVID A. KUBISKE  
REGISTERED PROFESSIONAL ENGINEER  
STATE OF MICHIGAN  
NO. 35793

DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

NOTE:  
ALL UTILITY EASEMENTS,  
LABELED AS SUCH, ARE  
FRANCHISE UTILITY EASEMENTS  
FOR GAS, PHONE, ELEC.  
AND/OR CABLE

NOTES

- ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MDOT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 2NS SAND BEDDING OR BETTER.
- UTILITY SERVICE LEADS SHALL BE BROUGHT TO ONE FOOT BEYOND THE PRIVATE EASEMENT FOR PUBLIC UTILITIES IN A COMMON TRENCH, BENCHED TO PROVIDE SEPARATION OF THE WATER AND SANITARY SERVICES. THE FOLLOWING NOTES APPLY FOR ALL UNITS EXCEPT 49-61 (TO WETLANDS)
  - ALL ROOF DRAINAGE MUST BE DIRECTED TO THE FRONT OF THE HOUSE OR TO THE FOOTING DRAINS.
  - ALL FOOTING DRAINS MUST DRAIN TO A SUMP.
  - SUMP PUMP FORCE MAIN MUST CONNECT TO THE 6-INCH GRAVITY STORM SEWER LEAD.
  - ALL STORM SEWER LEADS MUST BE GRAVITY LINES AND A MINIMUM OF 6 INCHES IN DIAMETER.
  - STORM SEWER LEAD MATERIAL MUST BE COLOR CODED TO BE UNIQUELY DIFFERENT FROM THE SANITARY SEWER SERVICE LEADS.
  - STORM SEWER LEADS SHALL BE SDR 26 PVC MATERIAL.
- MITIGATION/RETENTION AREA IN GENERAL COMMONS

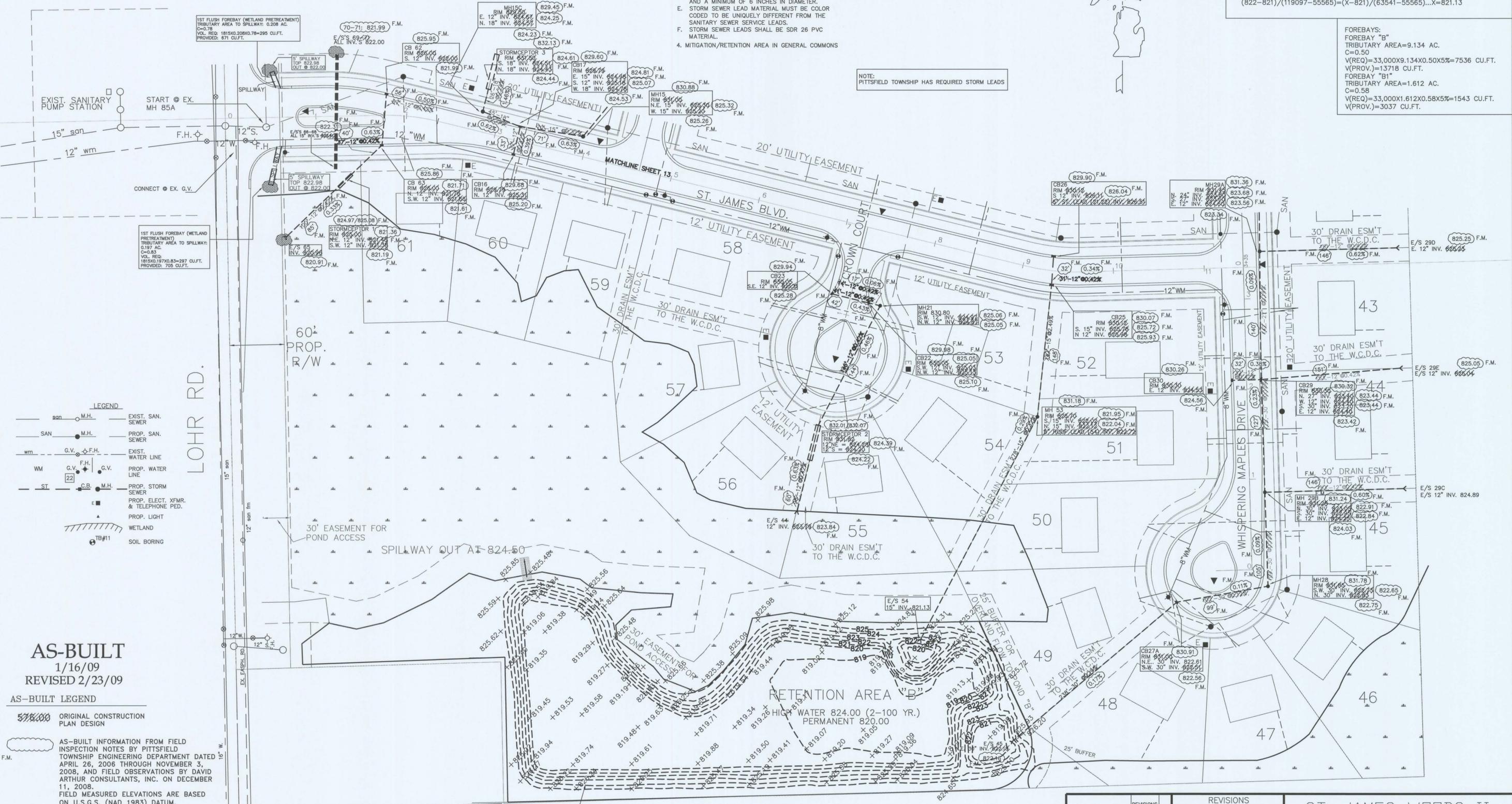
NOTE: PITTSFIELD TOWNSHIP HAS REQUIRED STORM LEADS

POND "B":  
C(comp)=0.58  
VOL. (req)=33,000X13.186AC.X0.59= 256,731 CU.FT.

POND CAPACITY	ELEVATION	AREA	DEPTH	VOLUME	TOTAL VOL.
824	93720	1	84834	275696	
823	75947	1	71765	190862	
822	67582	1	63532	119097	
821	59482	1	55565	55565	
820	51648	1	----	----	

VOL.(BANKFULL)=2.25\*(1/12)(43560)(13.186)(0.59)=63,541 CU.FT.  
ELEVATION @ BANKFULL  
(822-821)/(119097-55565)=(X-821)/(63541-55565)...X=821.13

FOREBAYS:  
FOREBAY "B"  
TRIBUTARY AREA=9.134 AC.  
C=0.50  
V(REQ)=33,000X9.134X0.50X5%=7536 CU.FT.  
V(PROV.)=13718 CU.FT.  
FOREBAY "B1"  
TRIBUTARY AREA=1.612 AC.  
C=0.58  
V(REQ)=33,000X1.612X0.58X5%=1543 CU.FT.  
V(PROV.)=3037 CU.FT.



LEGEND

san	M.H.	EXIST. SAN. SEWER
SAN	M.H.	PROP. SAN. SEWER
wm	G.V.	EXIST. WATER LINE
WM	G.V.	PROP. WATER LINE
ST	C.B.	PROP. STORM SEWER
		PROP. ELECT. XFMR. & TELEPHONE PED.
		PROP. LIGHT
		WETLAND
		SOIL BORING

AS-BUILT  
1/16/09  
REVISED 2/23/09

AS-BUILT LEGEND

5/16/09 ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:  
DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



OVERFLOW ASSESSMENT:  
IN THE EVENT THAT RETENTION POND "B" OVERFLOWS, A SPILLWAY WOULD RELEASE THE WATER INTO THE WETLANDS IN THE SOUTHEAST CORNER OF THE SITE

CSPA#96-22  
3 WORKING DAYS  
BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS	ITEM	DATE	BY
	WCRC/TWP	7/25/03	GM
	WCRC	5/22/03	GM
2/20/07	TWP	5/07/03	GM
8/4/05	REVISION	2/6/03	GM
7/11/05	REVISION	11/25/02	KMD
3/18/05	REVISION	10/30/02	KMD
1/17/05	REVISION	10/22/02	KMD
8/2/04	REVISION	08/30/02	KMD
3/31/04	REVISION	08/13/02	KMD

ST. JAMES WOODS II  
STORM PLAN

E.P. KUBSKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5908  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HORIZ 1" = 50'  
VERT 1" = 10'

JOB NO. 00068  
SHEET NO. 14 OF 42



EXIST. SANITARY PUMP STATION  
START @ EX. MH 85A  
F.H. 12" S.  
CONNECT @ EX. G.V.  
NOTE: UNDERCUT

ALL EXISTING UTILITY STRUCTURES IN THIS AREA WERE CONSTRUCTED UNDER THE NORTHWEST UTILITIES PROJECT BY AYRES, LEWIS, NORRIS, & MAY, INC. 50976-205, 215, 14W, 15W

**AS-BUILT**  
1/16/09  
REVISED 2/23/09

AS-BUILT LEGEND  
5/18/00 ORIGINAL CONSTRUCTION PLAN DESIGN

- NOTES**
1. ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MDOT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 2NS SAND BEDDING OR BETTER.
  2. SANITARY SERVICE LEAD SHALL BE LAID AT THE APPROPRIATE SLOPE TO AT LEAST ONE FOOT BEYOND THE UTILITY EASEMENT. FINAL LENGTH TO BE RECORDED BY FIELD INSPECTOR. END OF PIPE TO BE MARKED.
  3. ALL MANHOLES CASTINGS EJV 1040 TYPE "A"

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008.  
FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

STATE OF MICHIGAN  
DAVID A. KUBISKE  
ENGINEER  
NO. 35793  
LICENSED PROFESSIONAL ENGINEER

DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

AS-BUILT PLANS PREPARED BY:

REVISIONS	REVISIONS	REVISIONS
DATE	DATE	DATE
2/20/07	GM	VCRC/TWP
8/4/05	GM	VCRC
7/11/05	GM	TWP
4/26/05	GM	REVISION
3/18/05	GM	REVISION
1/17/05	GM	REVISION
8/2/04	GM	REVISION
3/31/04	GM	REVISION

ST. JAMES WOODS II

SANITARY PLAN

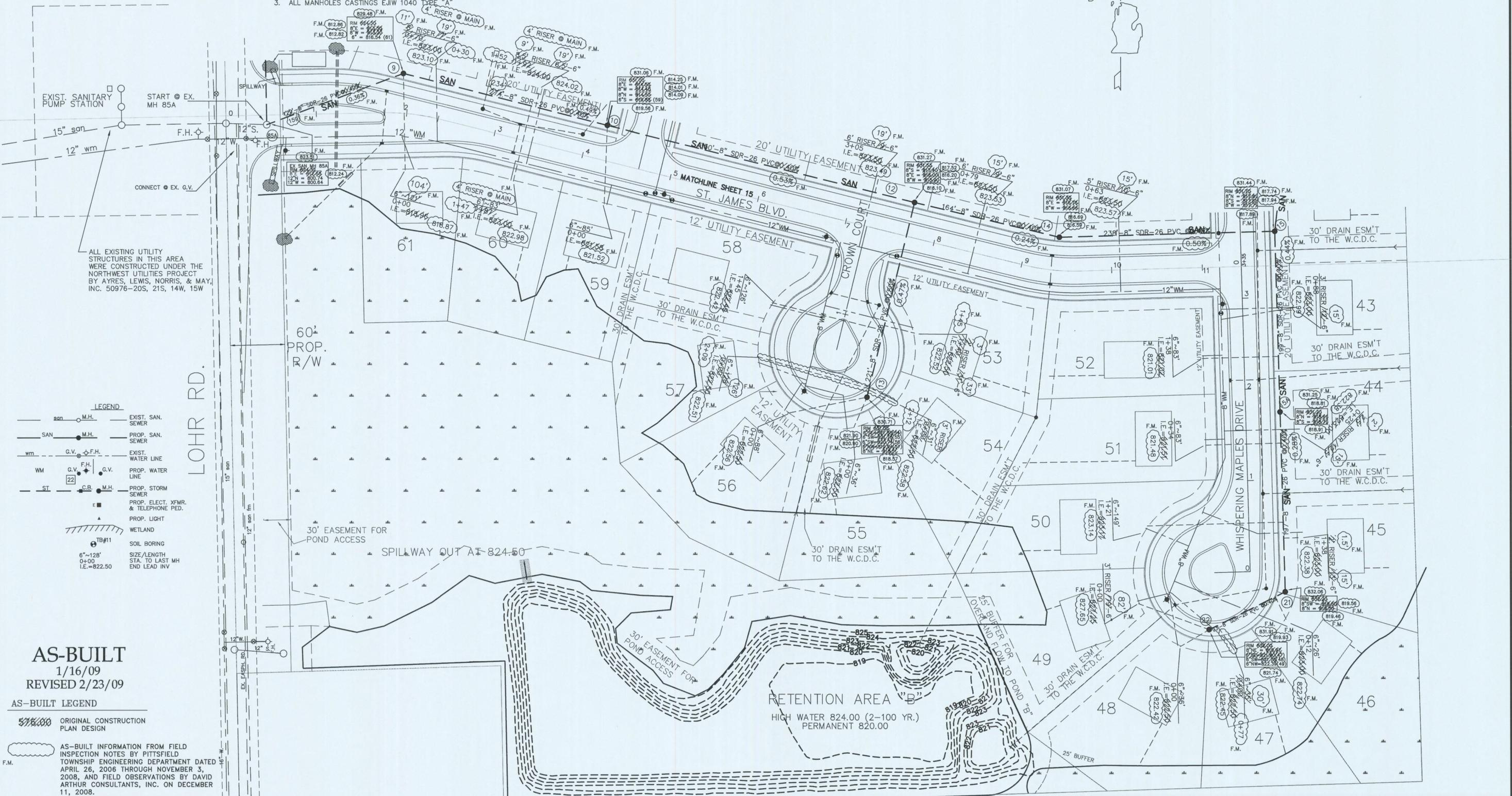
E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734)481-1322  
FAX (734)481-2215

SCALE  
HOR 1" = 60'  
VER 1" = 10'

FIELD BOOK NO.  
JOB NO.  
00068  
SHEET NO.  
15 OF 42

**NOTES**

1. ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MDOT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 2NS SAND BEDDING OR BETTER.
2. UTILITY SERVICE LEADS SHALL BE BROUGHT TO ONE FOOT BEYOND THE PRIVATE EASEMENT FOR PUBLIC UTILITIES IN A COMMON TRENCH, BENCHED TO PROVIDE SEPARATION OF THE WATER AND SANITARY SERVICES.
3. ALL MANHOLES CASTINGS EJ1W 1040 TYPE "A"



ALL EXISTING UTILITY STRUCTURES IN THIS AREA WERE CONSTRUCTED UNDER THE NORTHWEST UTILITIES PROJECT BY AYRES, LEWIS, NORRIS, & MAY, INC. 50976-20S, 21S, 14W, 15W

**LEGEND**

san	M.H.	EXIST. SAN. SEWER
SAN	M.H.	PROP. SAN. SEWER
wm	G.V.	EXIST. WATER LINE
WM	G.V.	PROP. WATER LINE
ST	C.B.	PROP. STORM SEWER
		PROP. ELECT. XFMR. & TELEPHONE PED.
		PROP. LIGHT
		WETLAND
	SB#11	SOIL BORING
	6"-12"	SIZE/LENGTH STA. TO LAST MH
	0+00	I.E.=822.50
		END LEAD INV

**AS-BUILT**  
1/16/09  
REVISED 2/23/09

**AS-BUILT LEGEND**

- 5/16/00 ORIGINAL CONSTRUCTION PLAN DESIGN
- AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008.
- FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:

**DAVID ARTHUR CONSULTANTS, INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



CSPA#96-22

3 WORKING DAYS  
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REVISIONS		REVISIONS	
DATE	BY	DATE	BY
7/25/03	GM	7/25/03	GM
5/22/03	GM	5/22/03	GM
5/07/03	GM	2/6/03	GM
11/25/02	KMD	10/30/02	KMD
10/22/02	KMD	10/22/02	KMD
08/30/02	KMD	08/30/02	KMD
08/13/02	KMD	08/13/02	KMD

**ST. JAMES WOODS II**

**SANITARY PLAN**

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5908  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE	HOR 1" = 50'
VER 1" = 10'	
FIELD BOOK NO.	
JOB NO.	00068
SHEET NO.	16 OF 42



**LEGEND**

sgn	M.H.	EXIST. SAN. SEWER
SAN	M.H.	PROP. SAN. SEWER
wm	G.V.	EXIST. WATER LINE
WM	G.V.	PROP. WATER LINE
ST	C.B.	PROP. STORM SEWER
		PROP. ELECT. XFMR. & TELEPHONE PED.
		PROP. LIGHT
		WETLAND
	TB#11	SOIL BORING
	6"-128"	SIZE/LENGTH STA. TO LAST MH
	0+00	END LEAD INV
	I.E.=822.50	

**AS-BUILT**  
1/16/09  
REVISED 2/23/09

AS-BUILT LEGEND  
5/18/00 ORIGINAL CONSTRUCTION PLAN DESIGN

- NOTES**
1. ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MDOT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 2NS SAND BEDDING OR BETTER.
  2. SANITARY SERVICE LEAD SHALL BE LAID AT THE APPROPRIATE SLOPE TO AT LEAST ONE FOOT BEYOND THE UTILITY EASEMENT. FINAL LENGTH TO BE RECORDED BY FIELD INSPECTOR. END OF PIPE TO BE MARKED.
  3. ALL MANHOLES CASTINGS EJV 1040 TYPE "A"

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008.  
FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

STATE OF MICHIGAN  
DAVID A. KUBISKE  
ENGINEER  
NO. 35793  
LICENSED PROFESSIONAL ENGINEER

DAVID ARTHUR CONSULTANTS, INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

AS-BUILT PLANS PREPARED BY:

REVISIONS	REVISIONS	REVISIONS
DATE	DATE	DATE
2/20/07	GM	VCRC/TWP
8/4/05	GM	VCRC
7/11/05	GM	TWP
4/26/05	GM	REVISION
3/18/05	GM	REVISION
1/17/05	GM	REVISION
8/2/04	GM	REVISION
3/31/04	GM	REVISION

ST. JAMES WOODS II  
SANITARY PLAN  
E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
(734)481-1322  
FAX (734)481-2215

SCALE  
HOR 1" = 60'  
VER 1" = 10'  
FIELD BOOK NO.  
JOB NO. 00068  
SHEET NO. 15 OF 42



WATER CONNECTION TO EX. MAIN SEE SHEET 21A FOR DETAIL

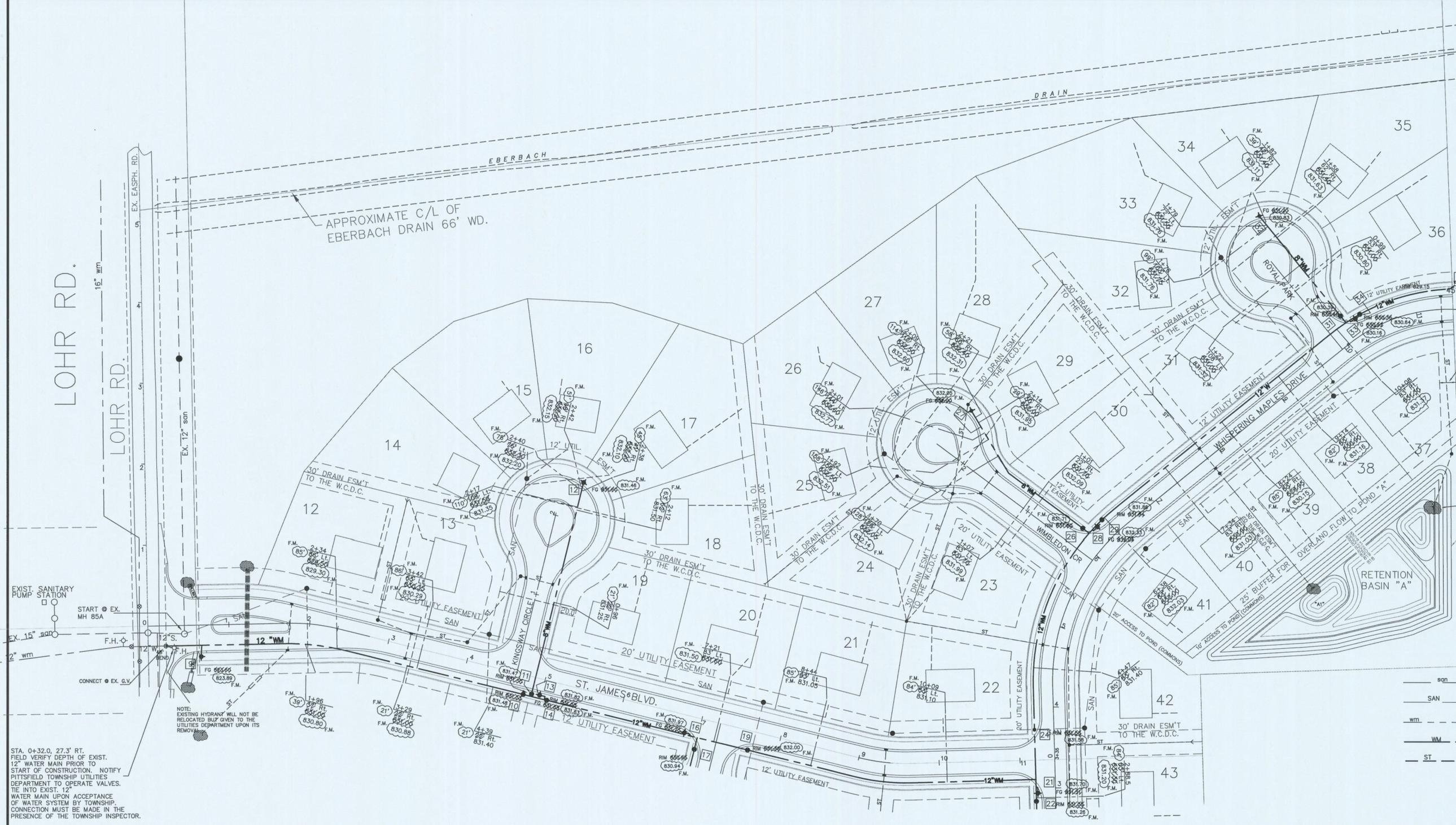
EXISTING WATERMAIN

HIGH WATER 100 YEAR STORM

RETENTION BASIN "A"

**LEGEND**

sgn	M.H.	EXIST. SAN. SEWER
SAN	M.H.	PROP. SAN. SEWER
wm	G.V.	EXIST. WATER LINE
WM	G.V.	PROP. WATER LINE
ST	C.B.	PROP. STORM SEWER
■	M.H.	PROP. ELECT. XFMR. & TELEPHONE PED.
▲		PROP. LIGHT
▨		WETLAND
⊕	TB#11	SOIL BORING
8+44	59' LT.	STATION ALONG C/L LENGTH OF LEAD CURB BOX ELEVATION



STA. 0+32.0, 27.3' RT. FIELD VERIFY DEPTH OF EXIST. 12" WATER MAIN PRIOR TO START OF CONSTRUCTION. NOTIFY PITTSFIELD TOWNSHIP UTILITIES DEPARTMENT TO OPERATE VALVES. TIE INTO EXIST. 12" WATER MAIN UPON ACCEPTANCE OF WATER SYSTEM BY TOWNSHIP. CONNECTION MUST BE MADE IN THE PRESENCE OF THE TOWNSHIP INSPECTOR.

NOTE: EXISTING HYDRANT WILL NOT BE RELOCATED BUT GIVEN TO THE UTILITIES DEPARTMENT UPON ITS REMOVAL.

**AS-BUILT**  
1/16/09  
REVISED 2/23/09

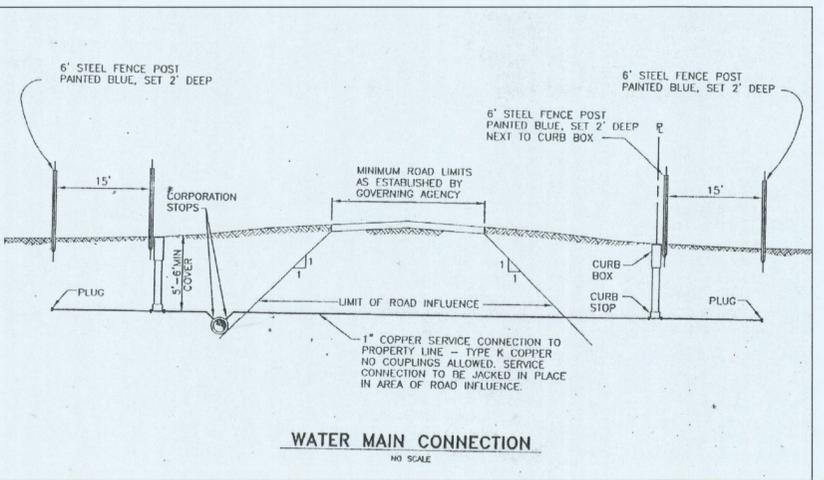
AS-BUILT LEGEND  
5/18/00 ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2008 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

- NOTES**
- ALL UTILITIES LYING WITHIN ROAD RIGHT-OF-WAY CORRIDOR (EXISTING OR PROPOSED) SHALL BE BACKFILLED WITH MDT CLASS II GRANULAR MATERIAL COMPACTED TO 95% MAXIMUM UNIT WEIGHT. ALL UTILITIES SHALL BE INSTALLED WITH 24S SAND BEDDING OR BETTER.
  - UTILITY SERVICE LEADS SHALL BE BROUGHT TO ONE FOOT BEYOND THE PRIVATE EASEMENT FOR PUBLIC UTILITIES IN A COMMON TRENCH, BENCHED TO PROVIDE SEPARATION OF THE WATER AND SANITARY SERVICES.
  - ALL GATE VALVE CASTINGS WILL BE EJW 1040 TYPE "A"



REVISIONS	ITEM	DATE	BY
	VCRC/TWP	7/25/03	GM
2/20/07	GM	VCRC	5/22/03
8/4/05	GM	TWP	5/07/03
7/11/05	GM	REVISION	2/6/03
4/26/05	GM	REVISION	11/25/02
3/18/05	GM	REVISION	10/30/02
1/17/05	GM	REVISION	10/22/02
8/2/04	GM	REVISION	08/30/02
3/31/04	GM	REVISION	08/13/02

**ST. JAMES WOODS II**

**WATER PLAN**

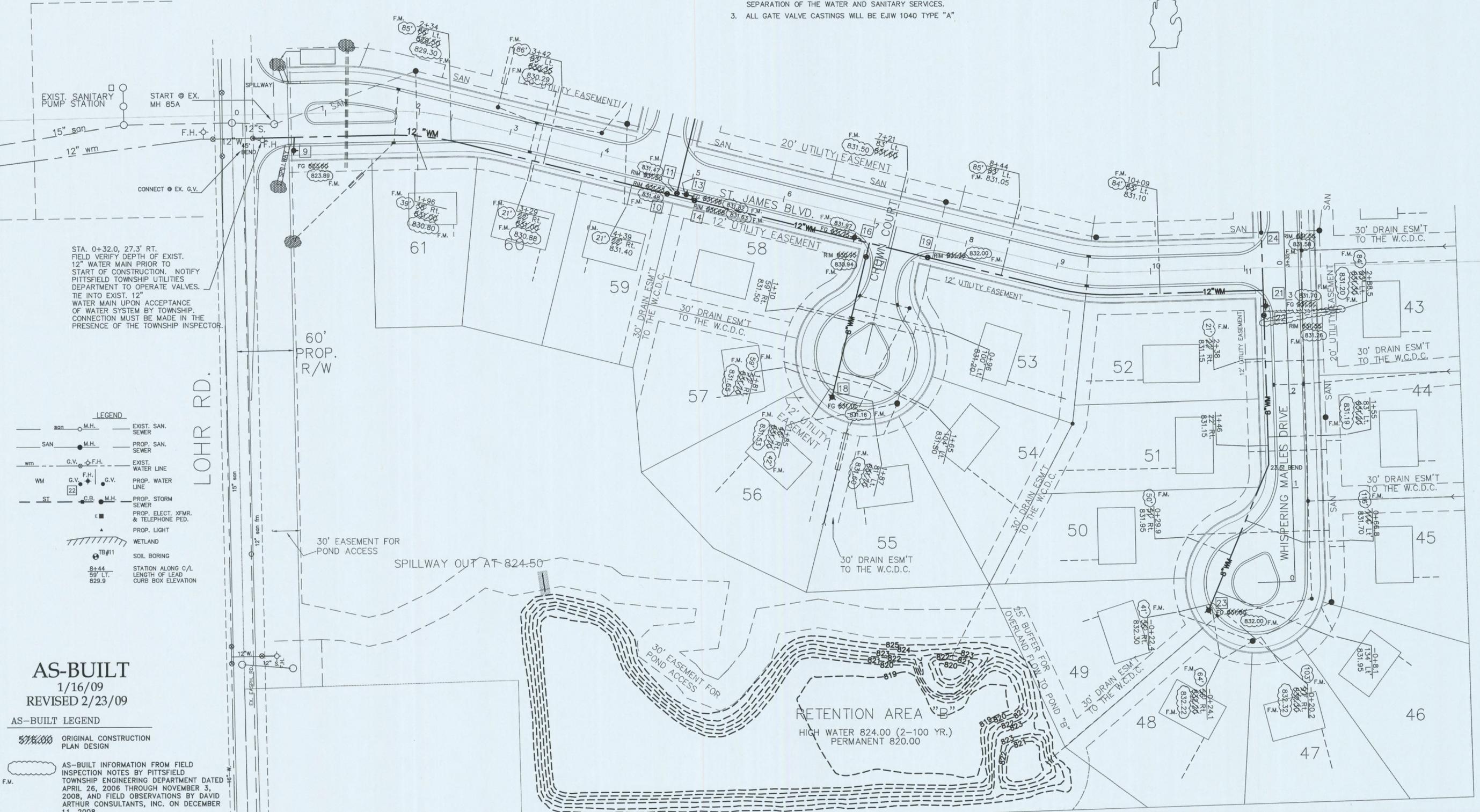
E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5908  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 60'  
VER 1" = 60'

JOB NO. 0006B  
SHEET NO. 17 OF 42

**NOTES**

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**LEGEND**

san	M.H.	EXIST. SAN. SEWER
SAN	M.H.	PROP. SAN. SEWER
wm	G.V. F.H.	EXIST. WATER LINE
WM	G.V. F.H.	PROP. WATER LINE
ST	G.B. M.H.	PROP. STORM SEWER
		PROP. ELECT. XFMR. & TELEPHONE PED.
		PROP. LIGHT
		WETLAND
	TB#11	SOIL BORING
	84+44 59' LT. 829.9	STATION ALONG C/L LENGTH OF LEAD CURB BOX ELEVATION

**AS-BUILT**  
1/16/09  
REVISED 2/23/09

**AS-BUILT LEGEND**

ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:

**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



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FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS		REVISIONS	
DATE	BY	ITEM	DATE
7/25/03	GM	WCRC/TWP	7/25/03
5/22/03	GM	WCRC	5/22/03
5/07/03	GM	TWP	5/07/03
2/6/03	GM	REVISION	2/6/03
11/25/02	KMD	REVISION	11/25/02
10/30/02	KMD	REVISION	10/30/02
10/22/02	KMD	REVISION	10/22/02
08/30/02	KMD	REVISION	08/30/02
08/13/02	GM	DESIGNED BY	08/13/02
		DRAWN BY	

**ST. JAMES WOODS II**

**WATER PLAN**

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
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(734) 481-1322  
FAX (734) 481-2215

SCALE: HOR 1" = 50'  
VER 1" = 10'

JOB NO. 00068  
SHEET NO. 18 OF 42





SECTION 2.04	EARTHWORK	2.04 Page 1	Earthwork	2.04 Page 2	Earthwork	2.04 Page 3	Earthwork	2.04 Page 4																																									
1.00 GENERAL																																																	
1.01 DESCRIPTION	<p>A. The CONTRACTOR shall perform all excavation and backfilling necessary to complete the work. This shall include the excavation of earth and rock, the removal and disposal of unsuitable material, dewatering, placement of suitable fill and backfill material, pipe boring and jacking, all quality assurance testing, and the restoration and final grading for all earth surfaces.</p>		<p>B. Steel encasing pipe used under channels and highways shall meet the requirements of the governmental agency having jurisdiction and the following minimum requirements:</p> <table border="1"> <thead> <tr> <th>Nominal Diameter Inches</th> <th>Maximum Wall Thickness</th> </tr> </thead> <tbody> <tr><td>Under 13</td><td>0.188 inches</td></tr> <tr><td>13-24</td><td>0.250 inches</td></tr> <tr><td>25-36</td><td>0.312 inches</td></tr> <tr><td>42</td><td>0.438 inches</td></tr> <tr><td>48</td><td>0.500 inches</td></tr> <tr><td>54</td><td>0.563 inches</td></tr> </tbody> </table>	Nominal Diameter Inches	Maximum Wall Thickness	Under 13	0.188 inches	13-24	0.250 inches	25-36	0.312 inches	42	0.438 inches	48	0.500 inches	54	0.563 inches		<p>B. All excavation, except where necessary to tunnel, bore or jack under roads, railroads, tree roots and other obstructions within the limits indicated on the Plans, may be open cut from the surface. Tunneling or boring under trees shall be considered as incidental to construction and will not be considered as cause for request for additional payment.</p>		<p>E. Other underground mains, sewers or structures encountered in the excavation shall be adequately supported during the CONTRACTOR'S operations, and before backfilling, shall be given permanent support as directed by the ENGINEER to meet the standards or requirements of the owning utility or agency.</p>																												
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1.02 WORK WITHIN RIGHTS-OF-WAY	<p>A. Where the governmental bodies having jurisdiction of the streets or rights-of-way have specific specifications relating to the requirements for work within their jurisdiction, such requirements must be met as a minimum requirement, and if these Specifications impose further limitation on the work, they shall also be met as the required work standard.</p> <p>B. During all operations of the CONTRACTOR in the streets and roadways, the CONTRACTOR shall maintain barricades, lights, and warning signs as required by the agency having jurisdiction.</p>		<p>C. Steel encasing pipe used under railroads shall meet the requirements of the railroad and the following minimum requirements:</p> <table border="1"> <thead> <tr> <th rowspan="2">Nominal Diameter Inches</th> <th colspan="2">Minimum Wall Thickness (inches)</th> </tr> <tr> <th>Coated or Cathodically Protected</th> <th>Uncoated &amp; Unprotected</th> </tr> </thead> <tbody> <tr><td>Under 14</td><td>0.180</td><td>0.251</td></tr> <tr><td>14-16</td><td>0.219</td><td>0.282</td></tr> <tr><td>18</td><td>0.250</td><td>0.313</td></tr> <tr><td>20</td><td>0.281</td><td>0.344</td></tr> <tr><td>22</td><td>0.312</td><td>0.375</td></tr> <tr><td>24</td><td>0.344</td><td>0.407</td></tr> <tr><td>26</td><td>0.375</td><td>0.438</td></tr> <tr><td>28-30</td><td>0.406</td><td>0.469</td></tr> <tr><td>32</td><td>0.438</td><td>0.501</td></tr> <tr><td>34-36</td><td>0.469</td><td>0.532</td></tr> <tr><td>38-42</td><td>0.500</td><td>0.563</td></tr> <tr><td>48</td><td>0.563</td><td>0.626</td></tr> </tbody> </table>	Nominal Diameter Inches	Minimum Wall Thickness (inches)		Coated or Cathodically Protected	Uncoated & Unprotected	Under 14	0.180	0.251	14-16	0.219	0.282	18	0.250	0.313	20	0.281	0.344	22	0.312	0.375	24	0.344	0.407	26	0.375	0.438	28-30	0.406	0.469	32	0.438	0.501	34-36	0.469	0.532	38-42	0.500	0.563	48	0.563	0.626		<p>C. Foreign material or unsuitable foundation material encountered such as wood, boulders, etc., which obstruct the excavation, shall be removed. Such materials found at the bottom of the excavation shall be removed and the foundation restored with approved materials.</p> <p>D. If excess excavation is made or the material becomes disturbed so as to require removal beyond the prescribed limits, the resulting space shall be filled with selected material solidly tamped into place, in not more than 6-inch layers to the satisfaction of the ENGINEER, before the construction work proceeds. At the direction of the ENGINEER, the excess excavation may be filled with 2000 psi concrete at the CONTRACTOR'S expense.</p>		<p>F. Water, sewer, gas and other utility services disturbed by the CONTRACTOR in his operations shall be repaired or replaced in a manner equal to the original condition by the CONTRACTOR at his own expense. Where these services are encountered and are undamaged, they shall be supported and/or protected by the CONTRACTOR at his expense against later settlement and/or damage after backfill. The CONTRACTOR shall consult the agency or the utility firm having jurisdiction over any duct line, gas main, etc., which may cross the excavation to determine method of supporting such duct or pipe.</p>	
Nominal Diameter Inches	Minimum Wall Thickness (inches)																																																
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1.03 WORK WITHIN EASEMENTS	<p>A. During construction within any easements, the CONTRACTOR shall confine himself to the limits shown on the Plans. He shall notify property owners in advance of moving equipment on easements and use of the access routes which will be designated by the OWNER. The OWNER will cooperate in working out the details of access. The topsoil over the trench shall be removed and carefully replaced upon completion of the work. The backfill of the trench in the easement may be left slightly high to provide for any slight residual settlement. Any trees, shrubs, or bushes removed shall be replaced to the satisfaction of the property owner.</p>		<p>D. Casing pipe joints shall be welded to form a leakproof continuous casing.</p> <p>E. The inside diameter of casing pipe shall be at least 2 inches greater than the largest outside diameter of the carrier pipe joints or couplings for carrier pipe less than 6 inches in diameter, and at least 4 inches greater than the largest outside diameter of the carrier pipe joints for carrier pipe 6 inches and over in diameter, unless otherwise shown on the Plans.</p>		<p>E. The excavation shall be kept dry during the work. Where water is encountered in the excavation, it shall be removed by pumping or well points. All necessary precautions shall be taken to prevent damage to existing wells and to completed or partially completed structures. The CONTRACTOR shall be responsible for all damages caused by him due to inadequate or improper protection.</p>		<p>G. Any excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve manhole covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a temporary basis.</p>																																										
1.04 SOIL BORINGS	<p>A. Soil boring results, if taken on a site, are appended to these Specifications with locations noted. Boring logs are shown to be generally representative of the site and to assist in the design and construction of the work.</p>		<p>F. The steel casing pipe shall be of smooth interior and shall be placed accurately to line and grade, allowing for the encased pipe thickness and supports under each length of encased pipe.</p>		<p>F. The CONTRACTOR shall take ample precautions to protect all trees and ornamental shrubbery not within the limits of the construction areas, or within the construction areas shown on the Plans to be retained from injury by workmen, equipment, or any other agencies connected with the work, including subcontractors. Such protection shall be provided during the progress of the excavation, grading, or other phases of the work as necessary. Such trees or shrubbery shall be surrounded by protective posts or fencing before construction begins, when in judgement of the ENGINEER, such precautionary measures are necessary. If, as a result of any phase of the work, trees are damaged or it is necessary to remove limbs in the way of construction, the repair of the damage and such limb removal shall be done by the CONTRACTOR as directed by the ENGINEER. All costs for the protective work shall be borne by the CONTRACTOR as incidental to the Contract work.</p>		<p>H. Any excavated material shall be piled in a manner that will not endanger the work and that will avoid obstructing sidewalks and driveways. Hydrants under pressure, valve manhole covers, valve boxes, curb stop boxes, fire and police call boxes, or other utility controls shall be left unobstructed and accessible until the work is completed. Gutters shall be kept clean, or other satisfactory provisions made for street drainage, and natural water courses shall not be obstructed except as otherwise provided for herein on a temporary basis.</p>																																										
2.00 PRODUCTS																																																	
2.01 BACKFILL MATERIAL	<p>A. For areas not requiring "granular backfill" material, backfill shall be of the excavated material, with the exception that materials such as soft clay, topsoil, muck, cinders, vegetable matter, refuse, boulders and other objectionable and non-packing earth shall be excluded from the backfill and removed from the site. Stone larger than 3 inches in any dimension shall be excluded from the backfill and removed from the site by the CONTRACTOR.</p> <p>B. Where "granular material" backfill is required as specified herein, backfill material shall be defined as a material meeting granular material Class II as defined in 2003 MDOT 902.08.</p>		<p>3.00 EXECUTION</p> <p>3.01 GENERAL EXCAVATION</p> <p>A. Excavation shall be performed by any practicable method consistent with the integrity and protection of the work and neighboring structures, workmen, and the public. Topsoil shall be separately removed and stockpiled for reuse.</p>		<p>3.02 EXCAVATION FOR SEWERS AND WATER MAINS</p> <p>A. Trenches shall be excavated to the depth required with allowance for bedding the pipe. The trench shall be cut wider and deeper at each pipe joint location to provide for properly completing the pipe joint and to relieve the joint of all loadings.</p> <p>B. The width of the trench at the top of a rigid pipe shall be sufficient to allow the pipe to be laid and jointed properly and shall provide for a minimum net clearance of 6 inches and a maximum net clearance of 12 inches on each side of the barrel of the pipe and to allow the backfill to be placed and properly compacted.</p> <p>C. The width of trench at the top of a flexible pipe backfill when using concrete bedding shall be sufficient to allow the pipe to be laid and jointed properly with the minimum net clearance of 12 inches and a maximum net clearance of 18 inches on each side of the barrel of the pipe.</p> <p>D. Where the conditions of the ground require, or where the work is in close proximity of existing structures, the sides of excavation shall be securely held by bracing and/or sheeting which may be removed in units when the level of the backfill has reached a point where it is safe to pull the</p>		<p>3.03 EXCAVATION FOR STRUCTURES</p> <p>A. Excavation for structures shall be extended sufficiently beyond the limits of the structure to provide ample room for form construction and for practicable construction methods to be followed.</p> <p>B. Requirements for excavation of sewers and water mains shall also apply to this Section.</p>																																										
	Pittsfield 230018.00.000	06/15/04		Pittsfield 230018.00.000	06/15/04		Pittsfield 230018.00.000	06/15/04																																									

Earthwork	2.04 Page 5	Earthwork	2.04 Page 6	Earthwork	2.04 Page 7	Earthwork	2.04 Page 8	Earthwork	2.04 Page 9		
<p>rock. Blasting shall be permitted only after it has been shown that other methods of excavation are impractical. All rock excavation shall be carried to a minimum depth of 8 inches below the pipe or manhole bottom and to the bottom of all footings. The width of the trench in the easement shall not exceed the diameter of the pipe plus 12 inches on either side or the edge of the foundation footing.</p> <p>B. When the use of explosives is necessary for the progression of the work, the CONTRACTOR shall comply with all laws, ordinances and applicable safety code requirements and regulations relative to the handling, storage and use of explosives and protection of life and property. A person competent and experienced in the use of explosives shall be employed to supervise the work. The CONTRACTOR shall schedule all blasting for a definite hour of the day and shall so notify all residents and businesses in the area as to the scheduled day and hour for such blasting operations. Explosive materials shall not be stockpiled and stored in residential areas. Explosives and initiating devices shall not be carried in the same vehicle.</p> <p>C. Suitable weighted plank coverings or timber mats shall be provided to confine all materials lifted by blasting within the limits of the excavation of trench. Excessive blasting or overshooting shall not be permitted. Any material outside of the authorized excavation cross section which may be shattered or loosened shall be removed at the CONTRACTOR'S expense. The CONTRACTOR shall be responsible for all damage resulting from the use of explosives.</p>		<p>Each casing spacer shall have at least six (6) integrally molded skids extending 1" beyond the bell or mechanical joint of the carrier pipe. The casing spacers shall be equal to the PSI Ranger as manufactured by Pipeline Seal and Insulator, Inc., Houston, TX.</p> <p>2. Casing spacers for carrier pipes larger than 24" shall be a PVC fusion bonded coated (10-16 mils) steel shell (minimum 14 gauge steel) with a 90 mil PVC inner liner and 2" wide 30% glass reinforced polyester runners (minimum compressive strength = 18,000 psi) (polyethylene is not an acceptable runner material) attached by 3/8" coated steel studs welded to the steel shell. All bolts and nuts used to fasten the shell to the carrier pipe shall be cadmium plated steel. Where riser are required under the runners they shall be a minimum 10 gauge steel welded to the shell and coated as specified for the shell (epoxy is not an acceptable coating for the shell riser). The casing spacers shall be equal to the PSI Model C as manufactured by Pipeline Seal and Insulator, Inc., Houston, Texas.</p>		<p>of materials ordered by the ENGINEER, nor any compensation for allowance of any kind whatsoever for or on account of any damage or delay resulting from such stoppage of work.</p> <p>F. Steel sheet piling may be either new or used. It shall be of adequate strength, straight and properly braced. Steel sheet piling shall be of the interlocking type. Friction in the interlocks shall not be assumed to contribute to the strength of the sheet piling.</p> <p>G. The design, planning, installation and removal. If required, of all sheet piling, shoring, sheeting, and bracing shall be accomplished in such a manner as to maintain the required excavation or trench section and to maintain the undisturbed state of the soils below and adjacent to the excavation.</p> <p>H. Steel sheet piling for the excavation shall be driven straight and in-line. The piling shall be supported aboveground, before driving, by a guide frame at least 20 ft high which will keep the piling accurately in the required position and vertical. Each piece of piling shall be driven only a few feet at a time and driving shall proceed continuously around the perimeter so that the piles shall reach their full penetration together.</p> <p>I. Walkers and bracing shall be supplied and installed as required to complete the sheeting system. Walkers and braces shall be of adequate strength for the load imposed. Splices in walkers shall develop the full strength of the member in bending, shear, and axial compression.</p> <p>J. If bracing members are to be removed during construction, the timing and procedure for removal shall not induce excessive stresses in the permanent structures or in steel sheet piling and bracing members.</p> <p>K. If the construction sequence of structures requires the transfer of bracing to the completed portions of any structure, the CONTRACTOR shall secure written acceptance of the ENGINEER prior to the installation of such bracing.</p> <p>L. In trenching operations the use of horizontal strutting below the barrel of pipe or the use of the pipe as support for trench racking will not be permitted. The use of a traveling shield for sewer construction shall require that the device be approved for use by a professional engineer. Sheet piling and timbers in trench excavations shall be withdrawn in a manner so as to prevent subsequent settlement of the pipe or additional backfill loadings which might overload the pipe.</p> <p>M. The neglect, failure, or refusal of the ENGINEER to order the use of sheeting, or sheet piling or steel, or to order the same to be left in place, or the giving or failure to give any order or directions as to the manner or methods of driving or placing sheeting, sheet piling, bracing, shores, etc., shall not in any way relieve the CONTRACTOR of any or all obligations under this Contract. Sheeting left in place shall be cut off one (1) ft below existing grade.</p> <p>N. The rules of the OSHA and the State Department of Labor with respect to excavation and construction shall at all times be strictly observed.</p>		<p>3.09 BACKFILLING FOR SEWERS AND WATER MAINS</p> <p>A. Backfilling shall consist of placement of the prescribed materials from a level 12 inches above the crown of the pipe. Placement shall be as follows:</p> <ol style="list-style-type: none"> <li>Under gravel driveways, gravel roads and shoulders, the backfill shall be granular material which shall be solidly compacted by mechanical tampers in layers of not more than 12 inches loose thickness with backfilling carried up to within 12 inches of finished grade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.</li> <li>Under pavements, curb, paved driveways, and sidewalks, the backfill shall be granular material compacted in layers not to exceed 12 inches loose thickness with backfilling carried up to subgrade. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content. After a period of about 60 days or less, if the backfill compaction is satisfactory to the ENGINEER, to provide for any slight settlement, the CONTRACTOR shall return neatly any broken edges of pavement and replace the top surface of the backfill within the pavement area with pavement surface equal to that surface which was removed. The pavement shall be replaced in accordance with the standard specifications of the agency having jurisdiction.</li> <li>Backfill around lift stations, or buried underground structures shall be granular material compacted in 12-inch lifts. Compaction of backfill shall be such as to obtain 95% of the maximum unit density as determined at the optimum moisture content.</li> <li>For all other areas, backfilling shall consist of placing excavated material as defined in Paragraph 2.01.A. of this Section, in 12-inch lifts to finish grade. Compaction of backfill shall be such as to obtain 90% of the maximum unit density as determined at the optimum moisture content.</li> </ol>		<p>combination thereof, as required by the ENGINEER. Each layer shall be compacted to not less than 95% of the maximum unit density as determined at the optimum moisture content. All parts of the embankment shall be uniformly compacted and the CONTRACTOR shall so direct all earthmoving equipment used in the work so that the same shall be attained. Embankment or fill not outside the limits of the subgrade where sand or gravel is not required shall be made with suitable material which is free from perishable organic matter, rubbish, stones, broken concrete, roots, or other foreign materials, at no additional compensation. Before any embankments are begun, the base shall be made firm and cleared of topsoil, sod or other perishable material. The sides of the embankment shall be neatly and evenly dressed to the slope shown on the Plans, or such other slope as the ENGINEER may direct.</p> <p>B. Upon completion of the placing of the curbs, and after the concrete has cured sufficiently, forms shall be removed and the excavated space behind the curb shall be backfilled with a good quality of surface soil, free of rubbish, stone, broken concrete, roots or other foreign material. Where approved acceptable material for backfill behind the curbs is not available, granular fill conforming to 2003 MDOT 8.02.06, Class II, shall be used. Where the area behind the curb is in cut, it shall be trimmed from the top of the curb on the slope shown on the Plans. If the area is in embankment or fill, an earth berm shall be placed immediately adjacent to the top of the curb and then the embankment of fill shall be finished to the slope shown on the Plans. All trimming and finishing shall be done in a neat, workmanlike manner. All excess concrete and debris shall be removed from the excavation behind the curb line before backfilling begins.</p> <p>C. In construction of non-rigid pavements, backfilling back of curb and gutter shall be completed before placement and compaction of the base course of the roadway.</p>			
<p>3.06 PIPE BORING AND JACKING</p> <p>A. The CONTRACTOR shall obtain all necessary permits for jacking the encasing pipe under channels, highways and/or railroads and shall notify the governmental agency and/or company having jurisdiction 48 hrs before work at any crossing is started. The CONTRACTOR shall pay all costs for an inspector and/or flagmen required by a railroad or governmental agency.</p> <p>B. A suitable approach trench shall be opened, adjacent to the toe of the slope of the embankment. The approach trench shall be long enough to accommodate the length of pipe units to be placed, and wide enough to provide sufficient working room. Guide timbers or rails for keeping the pipe on-line and grade shall be installed in the bottom of the trench and heavy timber backstop supports installed at the rear of the trench to take the thrust of the jacks. A timber bearing a "pushing frame" shall be built and furnished to fit or match the end of the pipe to be jacked, so that the pressure of the jacks will be evenly distributed over the end of the pipe. Two (2) hydraulic jacks of sufficient power shall be used to apply pushing or jacking pressure. For firm ground, excavation shall be carried on from inside the pipe, not to exceed twelve (12) inches ahead of the lead pipe. For unstable ground, the lead pipe shall precede the auger. Excavation at the top and sides shall be accurately cut to line and grade. Adjoining sections of steel pipe shall be welded. Pipe shall be jacked on successive shifts until completed to guard against the "freezing of the line" due to settlement and compaction of surrounding soil.</p> <p>C. The sheeting of pits along any road will be required if the leading edge of all work pits will be closer to the pavement edge than the shoulder point or ten (10) ft, whichever ever distance is greater, on curb and gutter sections, at least five (5) ft from back of curb.</p> <p>D. Upon completion of the installation of the steel pipe encasement, the contractor shall furnish and install a bolted steel casing spacer as described below on the carrier pipe. Casing spacers shall be placed a maximum of seven (7) feet apart along the length of the carrier pipe with one casing spacer within 2-1/2 feet of each side of a pipe joint and the rest evenly spaced. Wood skids are not an acceptable method of supporting the carrier pipe.</p> <p>1. Casing spacers for carrier pipes from 4" - 24" shall be made of a molded, segmented high density polyethylene plastic with 304 stainless steel connecting nuts and bolts. Minimum spacer width shall be 5.2" for carrier pipes from 4" - 12" and 7.0" for carrier pipes 14" - 24".</p>		<p>3.07 SHORING, SHEETING AND BRACING</p> <p>A. Where sheet piling, shoring, sheeting, bracing, or other supports are necessary, they shall be furnished, placed, maintained, and except as shown or specified otherwise, removed by the CONTRACTOR.</p> <p>B. All sheet piling, shoring, sheeting and bracing shall be designed by a professional engineer engaged by the CONTRACTOR with demonstrated competence and experience in such work. The sheeting system shall be designed to prevent bottom failure and hydrostatic uplift within the excavation. Provision shall also be made in the design for lateral pressures due to side slope and construction equipment or other surcharge loads, as applicable.</p> <p>C. The CONTRACTOR shall provide to the ENGINEER for his review, design calculation and arrangement drawings of the sheeting system prior to ordering any materials for bracing, sheeting, etc., and prior to the commencement of the excavation.</p> <p>D. All materials, except as otherwise specified, used for sheeting and sheet piling, lagging, braces, shores, and stringers, or waling strips shall be of approved quality and dimensions throughout.</p> <p>E. Materials for sheeting systems shall be furnished and driven or set in place by the CONTRACTOR, where necessary or wherever ordered by the ENGINEER, whether the same is or is not considered necessary by the CONTRACTOR. If, in the opinion of the ENGINEER, the materials furnished by the CONTRACTOR are not of proper quality or sufficient size or not properly placed to ensure the safety of the work or of adjacent structures and property, the CONTRACTOR shall, upon notice from the ENGINEER to that effect, forthwith procure, furnish and set in place or drive other and satisfactory materials, or place the material in a satisfactory manner; and if he shall fail or neglect to do so, the ENGINEER may order all or any part of the work to be stopped until such materials so used are furnished and placed; and the CONTRACTOR shall not be entitled to claim, demand, or receive any compensation for larger size or better quality or different disposal</p>		<p>3.10 FILLING AND BACKFILLING FOR STRUCTURES</p> <p>A. Embankments underlying structural footings, streets and drives, sidewalks and around structures shall be granular material meeting the requirements of the Michigan Department of Transportation for granular material compacted to 95% density.</p> <p>B. In all other areas, material required for embankments and backfilling shall be soil or soil-rock mixture free of organic and other deleterious matter and shall contain no more than 15% rocks or lumps larger than 2-1/2 inches in the greatest dimension, compacted to 90% density.</p> <p>C. Under all interior and exterior floor slabs, an 8-inch thick granular cushion shall be placed. This material shall be clean mineral aggregate meeting the following gradation requirements:</p> <table border="1"> <thead> <tr> <th>Passing the No. 4 Sieve</th> <th>100%</th> </tr> <tr> <th>Passing the No. 200 Sieve</th> <th>0-3%</th> </tr> </thead> </table> <p>D. Where embankment material is placed to achieve a new surface elevation, the top 4 inches shall be approved topsoil either salvaged from the site or hauled in by the CONTRACTOR.</p>	Passing the No. 4 Sieve	100%	Passing the No. 200 Sieve	0-3%		<p>3.11 FILLING AND BACKFILLING FOR PAVED SURFACES</p> <p>A. Embankments, including sand cushions and granular fills, shall be placed in successive layers not more than 6 inches in depth the full width of the cross section, each layer to be thoroughly compacted by means of vibratory compactors or by an approved pneumatic-tired roller or</p>	
Passing the No. 4 Sieve	100%										
Passing the No. 200 Sieve	0-3%										
	Pittsfield 230018.00.000	06/15/04		Pittsfield 230018.00.000	06/15/04		Pittsfield 230018.00.000	06/15/04			

**Water Main**

2.09  
Page 12

3. If no valve or hydrant is available, the upper section only of a valve box shall be set with the tracer wire stubbed up inside.

END OF SECTION

AS-BUILT PLANS PREPARED BY:

DAVID ARTHUR CONSULTANTS INC.

110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

AS-BUILT  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

C.S.P.A. #96-22

ST. JAMES WOODS II

STANDARD SPECIFICATIONS

E.P. KUBISKE & ASSOCIATES, INC.

1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
TWP	7/11/05	GM
WCRC/TWP/WCDD	1/17/05	GM
WCRC/TWP	6/21/04	GM
REV. TWP/WCRC		GM
DRAWN BY	DESIGNED BY	DATE
GM		3/31/04

SCALE  
HOR 1" =  
VER 1" =

FIELD BOOK NO.

JOB NO.  
00068

SHEET NO.  
39 OF 42



<b>Water Main</b>	<b>2.09</b> Page 9
<b>3.00 EXECUTION</b>	
<b>3.01 EXCAVATION AND BACKFILL</b>	
A. All excavation and backfill 12 inches above the crown of the pipe shall conform to Section 2.04, Earthwork, of these specifications.	
<b>3.02 BEDDING</b>	
A. Ductile iron pipes shall be fully enclosed in polywrap and laid on a compacted sand cushion, 4 inches thick. Sand shall conform to fine aggregate 2NS as defined in 1996 MDOT 902.08.	
B. 2NS sand bedding material shall be placed around and above the main to a height of 12 inches above the main.	
C. Sand shall be compacted on top of 12 inches above the pipe to not less than 95 percent of the maximum unit density as determined at optimum moisture content.	
<b>3.03 PIPE INSTALLATION</b>	
A. Any pipe damaged in transport or handling shall be rejected and removed from the site of the work.	
B. In handling and placing ductile iron pipe and fittings, no metal shall be used in contact with the inside of the pipe to fit or support the pipe. The pipe shall be moved only through the use of belt slings or automatic release type pipe tongs. Care shall be taken not to injure the pipe or pipe coating, and no damaged or imperfect pipe shall be used in the work except that minor damage to pipe coating may be repaired subject to the review of the ENGINEER.	
C. All pipe and fittings shall be carefully lowered and moved into position in the trench or vault in a controlled manner such as will prevent damage to the pipe and its coating and lining.	
D. In assembly of push-on or shove type joints, the bell socket recess and the gasket shall be wiped clean and the gasket placed properly in position. A thin film of lubricant shall then be applied to the surface of the gasket to come into contact with the entering pipe. The plain end of the entering pipe shall be cleaned and then entered and forced home to the base of the socket. Where pipe is cut, the entering end shall be beveled before being inserted in the joint. Where time permits drying, the cut and beveled ends shall be coated with coal tar enamel.	
E. To prevent trench water from entering the pipe, joints which for any reason may not be completed as the pipe is laid shall be thoroughly packed with approved material, in a manner to make them watertight. Open ends of fittings shall be tightly closed with approved plugs and well packed, as shall the end of the last pipe laid whenever work is not in progress.	
F. Each pipe shall be laid accurately to the line and grade shown on the Plans. Whenever it is necessary to deflect pipe from a straight line, either in the horizontal or vertical plane, to avoid obstructions, or where long radius curves are permitted, the amount of deflection allowed shall not exceed that required for satisfactory jointing and shall be reviewed by the ENGINEER. In no case shall deflection of joints exceed the manufacturer's recommended maximum deflection.	
G. The CONTRACTOR shall not be entitled to any additional compensation because depth is more than specified at certain locations or due to clearances at manholes, or due to unforeseen obstacles, or occasioned in order to avoid undue changes in grade.	
Pittsfield 230018.00.0000	06/20/05

<b>Water Main</b>	<b>2.09</b> Page 10
H. The trench shall be backfilled closely behind the pipe laying. Unless otherwise directed or permitted by the ENGINEER, the backfilling shall follow and be completed to the top of the trench to within two lengths behind pipe laying.	
I. Field lock joints designed to hold the pipe to proper line and grade against internal static and dynamic forces and external loads shall be provided at all tees, wyes and plugs, and wherever the pipe is deflected from a straight line and the resultant forces are not self-contained through the use of flanges, anchor ties and the like. Concrete thrust blocks or anchorage shall be 3000 PSI concrete.	
J. Air release valve and manhole shall be constructed where shown on the Plans. All castings and manholes shall be as specified under gatewells. Gatewells shall be constructed in accordance with the details shown on the Plans.	
K. Blow-off valves and manholes shall be constructed in accordance with the details shown on the Plans. All castings shall be as specified under gatewells.	
<b>3.04 CONNECTION TO EXISTING MAINS</b>	
A. When making a dry connection to an existing main, the existing main to which a connection is to be made shall be isolated by the closing of the necessary existing valves, and the water from the existing main shall then be pumped out or removed by other means so the connection may be made in the dry. After the connection has been acceptably made, the portion of the new line to the nearest valve shall be satisfactorily tested and disinfected, along with the drained portion of the existing main, before the isolated existing main is placed back in service, except as the ENGINEER may otherwise direct. In as much as residents served by this isolated main will be temporarily out of water during this period, the work shall be executed as rapidly as possible, and the time of, and the procedure in, making such connections shall be subject to the review of the ENGINEER. Such work may be required to be done at night in order to minimize inconvenience of water users. The CONTRACTOR shall not be entitled to any additional compensation because of night work or other special requirements in work under this Section.	
B. The CONTRACTOR shall make particular effort, prior to bidding, to ascertain whether or not valves in the existing mains to be connected to the new mains are so located as to provide isolation. If valves are not found to be adequate, then the CONTRACTOR shall utilize other means to make the connections with a minimum of interruption to service.	
C. When making a wet tap connection to an existing main, a tapping sleeve designed for the type of pipe being tapped shall be utilized and the tap shall be made in accordance with the manufacturer of the tapping equipment.	
D. Wherever adapters are required to properly connect the pipe with existing pipe or other material or manufacturer, the nominal I.D. of adapters shall be the same size as the nominal diameter of pipe connected thereto. Adapters shall also be furnished and used as required by the manufacturer for connection to fittings.	
<b>3.05 SERVICE LEADS</b>	
A. Service leads shall be installed where shown on the Plans. All service taps shall be the "wet" method type and no tap shall be made until the acceptance test has been conducted and the line is under pressure.	
Pittsfield 230018.00.0000	06/20/05

<b>Water Main</b>	<b>2.09</b> Page 11
B. When crossing a paved street, the service lead shall be jacked under the pavement. Augering and/or jacking requirements on paved streets for the installation of pipe less than 2-1/2" outside diameter shall be made by a "compactor" type machine or similar method without removing existing soil, if soil conditions permit.	
C. Depth of bury for all service leads shall be between 5 and 7 feet from finish grade.	
<b>3.06 HYDRANTS</b>	
A. Fire hydrants shall be constructed in accordance with the details shown on the Plans. Finish grade level to center of nozzle caps shall measure between 24 and 30 inches. A maximum of one hydrant barrel extension and one operating stem extension may be used to accommodate changes in grade. Under no conditions shall extended hydrant have more than one coupling in the operating stem. Pumper connections shall point toward the street.	
B. Fire hydrants shall be installed with barrel vertical and properly based. Concrete thrust blocks shall be placed behind the hydrant, tee, and every bend. Care should be taken to insure that the drain holes on the hydrant are not plugged by the thrust blocks. Hydrant shall be set in 1 yard of coarse gravel for drainage purposes. If ground water is encountered, the drain hole shall be plugged as directed by the manufacturer. The backfill shall be sand thoroughly tamped around the hydrant and valve box in 1 ft layers.	
C. Fire hydrant and gate valve shall be set apart 24 inches. Gate valves and valve box shall be as specified under the valve paragraphs of this Section.	
<b>3.07 TRACER WIRE</b>	
A. Tracer wire shall be installed along the top of all water mains at a height of not more than 6 inches above the pipe. Wire shall be extended to all hydrants, service leads, blowoffs, dead ends, buildings and post indicator valves. Tracer wire shall be brought to grade, leaving enough excess material to avoid loss or damage to wire during construction and subsequent activities.	
B. When tracer wire is to be run along short offsets (less than 20 feet), a loop of wire shall be utilized to loop to the end of the offset, bring the loop to grade and terminate it in an approved manner. For service leads and offsets of more than 20 feet in length, a splice may be utilized to make this connection at the main, following manufacturer's instructions. The tracer wire shall then be installed and terminated in an approved manner.	
C. Tracer wire terminations shall be made by one of the following methods:	
1. Tracer wire shall be terminated at hydrants by securing the wire to the nozzle chain at the hydrant, leaving excess material for future hydrant maintenance.	
2. Terminations at valve/curb boxes, post indicators valves and blow-offs shall be made with 2 wraps of the wire at grade around the box or pipe, leaving excess material for future trimming following landscaping activities.	
3. Gatewell terminations shall be made by running the tracer wire through the pipe opening in the wall, down to and across the floor to the steps, up the wall and secure to the top step leaving the stub accessible at the casting. Wire shall be run through the gatewell such that it does not create a hazard.	
4. Terminations shall be made above grade at buildings near the water meter or as directed by the Pittsfield Township Utility Department.	
Pittsfield 230018.00.0000	06/20/05

<b>Sanitary Sewers and Manholes</b>	<b>2.10</b> Page 4
Pipe I.D.	Pig O.D.
6 inches	5.33 inches
8 inches	7.11 inches
10 inches	8.87 inches
12 inches	10.55 inches
15 inches	12.90 inches
18 inches	15.74 inches
3. The pig shall be drawn by hand through the pipe from manhole to manhole. Any portion of pipe through which the pig passes freely shall be deemed to have passed the deflection test. Sections of pipe through which the pig does not pass shall be located, uncovered and the pipe zone bedding improved and backfilled by the CONTRACTOR at his own expense. The pig shall then be retested before acceptance is granted.	
H. Material Tests	
1. The CONTRACTOR shall have tests of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the Specifications.	
<b>1.03 SUBMITTALS</b>	
A. The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections, and valves. The Contractor shall submit certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.	
<b>2.00 PRODUCTS</b>	
<b>2.01 SEWER PIPE</b>	
A. Pipe for sewer 24-inch diameter and smaller shall be polyvinyl chloride (PVC). Pipe for 30-inch diameter and larger shall be PVC truss pipe. Ductile iron pipe and reinforced concrete pipe shall be used as specified by the ENGINEER.	
B. Pipe for service leads 4 through 8 inches in diameter shall be polyvinyl chloride (PVC).	
C. Reinforced concrete pipe shall be no less than the latest revision of ASTM C76, with the class designation as shown on the Plans or in the Proposal.	
D. PVC pipe 4 inches through 15 inches in diameter shall meet or exceed all of the requirements of the current ASTM D-3034 SDR-26 polyvinyl chloride sewer pipe and fittings. 18-inch diameter PVC pipe shall meet or exceed all of the requirements of the current ASTM F-679 SDR 26 polyvinyl chloride sewer pipe and fittings. Samples of pipe and physical and chemical data sheets shall be submitted to the ENGINEER for review. Approval shall be obtained before pipe is purchased.	
E. Truss pipe shall meet or exceed all of the requirements of the current ASTM D2680.	
Pittsfield 230018.00.0000	06/15/04

<b>SECTION 2.10 SANITARY SEWERS AND MANHOLES</b>	<b>2.10</b> Page 1
<b>1.00 GENERAL</b>	
<b>1.01 DESCRIPTION</b>	
A. The CONTRACTOR shall furnish all labor, tools, equipment and materials to construct all sanitary sewers, manholes and necessary appurtenant work as herein specified. No sewers shall be accepted until the sewer system has passed the system acceptance tests.	
<b>1.02 TESTING</b>	
A. General	
1. The CONTRACTOR shall furnish all equipment and personnel to conduct system acceptance tests as specified herein on all completed sewers. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire sewer system is constructed and has been installed for not less than 30 days.	
2. The CONTRACTOR may desire to make an air test prior to backfill for his own purposes but the line acceptance tests shall be conducted after backfilling or extensions.	
3. All sewer lines shall be televised while running enough water through the line to be visible at the next downstream manhole.	
4. All sewer lines shall be checked for alignment.	
5. All manholes shall be tested for leakage. All PVC lines shall be tested for deflection.	
6. Sewer pipe 30 inches and smaller shall be air tested. Sewer pipe larger than 30 inches shall be tested by either infiltration or exfiltration and shall be tested in lengths of 1600 feet or less.	
6. Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall, at his own expense, locate and repair rejected section and retest until it is within specified allowance.	
B. Test for Leakage - Air Test	
1. After a manhole-to-manhole section of line has been backfilled and cleaned, it shall be plugged at each manhole with pneumatic plugs inflated to 35 psig internal pressure. The design of the pneumatic plugs shall be such that they will hold against the line test pressure without requiring external blocking or bracing.	
2. There shall be three (3) hose connections to the pneumatic plug. One hose shall be used only for inflation of the pneumatic plug. The second hose shall be used for continuously reading the air pressure rise in the sealed line. The third hose shall be used only for introducing low pressure air into the sealed line.	
3. There shall be a 0-30 psig gauge for reading the internal pressure of the line being tested. Calibrations from the 1-10 psig range shall be in tenths of lbs (not ounces) and this 0-10 portion shall cover 90% of the complete dial range.	
4. Low pressure air shall be introduced into the sealed line until the internal air pressure reaches 4.0 psig greater than the average back pressure of any ground water pressure that may be over the pipe. At least two (2) minutes shall be allowed for the air pressure to stabilize. After the stabilization period, the third hose shall be disconnected.	
Pittsfield 230018.00.0000	06/15/04

<b>Sanitary Sewers and Manholes</b>	<b>2.10</b> Page 2	
5. The portion of line being tested shall be accepted if the portion under test meets the following conditions.		
a. DI, and RCP Pipes		
(1) The time requirement for the pressure to decrease from 3.5 to 2.5 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than the time given in the following table:		
Pipe	Min. Holding Time Seconds/100 ft. Pipe	
4-inch	18	
6-inch	42	
8-inch	72	
10-inch	90	
12-inch	108	
15-inch	126	
18-inch	144	
21-inch	180	
24-inch	216	
27-inch	252	
30-inch	288	
(2) In areas where ground water is known to exist, the CONTRACTOR shall install a 1/2-inch diameter capped pipe nipple, approximately 10 inches long, through the manhole wall on top of one of the sewer lines entering the manhole. This shall be done at the time the sewer line is installed. Immediately prior to the performance of the line acceptance test, the ground water level shall be determined by removing the pipe cap, blowing air through the pipe nipple into the ground so as to clear it, and then connecting a clear plastic tube to the pipe nipple. The hose shall be held vertically and a measurement of the height in feet of water shall be taken after the water stops rising in this plastic tube. The height in feet shall be divided by 2.3 to establish the lbs of pressure that will be added to all readings. For example, if the height of water is 11-1/2 ft, then the added pressure will be 5 psig. This makes the 3.5 psig to be 8.5 psig, and the 2.5 psig to be 7.5 psig. The 1 lb allowable drop and the timing remains the same.		
b. PVC Pipe		
(1) The time requirement for the pressure to decrease from 3.5 to 3.0 psig (greater than the average back pressure of any ground water that may be over the pipe) shall not be less than that shown in the following table:		
Pipe Size (inches)	Holding Time (seconds)	Minimum Holding Time (seconds)
4-inch	0.190xL	113
6-inch	0.427xL	170
8-inch	0.760xL	227
10-inch	1.187xL	283
12-inch	1.709xL	340
15-inch	2.671xL	425
Pittsfield 230018.00.0000	06/15/04	

<b>Sanitary Sewers and Manholes</b>	<b>2.10</b> Page 3	
18-inch	3.846xL	512
(2) If any section of the sewer fails to meet this requirement, the CONTRACTOR shall perform a television inspection of the faulty section and repair or replace at his own expense all defective materials and/or workmanship to the satisfaction of the ENGINEER. The test procedure shall be repeated until the results are acceptable.		
C. Test for Infiltration		
1. Sewer pipe over 18 inches shall be tested to measure the infiltration of ground water. If the measured leakage exceeds 200 gallons per inch diameter per mile of pipe per 24 hr period, the CONTRACTOR shall locate the points of excessive leakage and make the necessary repairs at his own expense.		
2. In the event the line does not pass the infiltration test as stated above, the test shall be repeated after suitable repairs have been completed.		
D. Test for Exfiltration		
1. Where the ground water provides less than a 2 ft head on the sewer, an exfiltration test shall be conducted by filling the sewer with water to a 4 ft head or 4 ft above the ground water level, whichever is greater. The allowable water loss shall be 200 gal/in./mi/day as calculated above for infiltration.		
2. After the sewer has been filled with water, 4 hrs time shall be allowed for water absorption by the pipe before exfiltration tests are initiated.		
3. For the purpose of establishing the 4 ft test head, the head shall be measured from the center of the sewer pipe at the midpoint of the test section length. This procedure shall be used for both infiltration and exfiltration tests.		
E. Test for Manhole Leakage		
1. All manholes shall be tested for leakage by using plugs on inletting-outletting sewers, and filling the manholes with water to the top of the manhole. Four hours shall be allowed for water absorption by the manhole before testing is initiated. Allowable exfiltration for 48-inch diameter manholes shall be 2 gallons per foot of depth per day.		
F. Test for Alignment		
1. All sewers shall be laid accurately to the line and grade designed by the ENGINEER. The sewers will be tested for alignment by shining a light through the pipe at a manhole and viewing the light from an adjacent manhole. Any section of sewer in which a light cannot be seen from one manhole to the next shall be corrected to the satisfaction of the ENGINEER to pass this test.		
G. Test for Deflection of PVC Pipe		
1. PVC pipe sewers shall be installed in such a manner that the initial deflection of the conduit shall conform to the latest revision of ASTM D-3034.		
2. Deflection of PVC pipe shall be tested by pulling a rigid pig or equivalent through the pipe. The pig shall be constructed in accordance with the following table of maximum outside diameters and shall be submitted to the ENGINEER for review before testing is initiated.		
Pittsfield 230018.00.0000	06/15/04	

<b>Water Main</b>	<b>2.09</b> Page 12
D. When connections are made to existing water mains which do not have tracer wire, the following method most applicable to the field condition shall be used.	
1. When connection is made at/over a valve or hydrant, the connection shall be made in the same manner as the termination at said structures in Item C(2) above.	
2. When connection takes place in a gatewell, the same procedure shall be used as in termination at a gatewell (see Item C(3) above).	
3. If no valve or hydrant is available, the upper section only of a valve box shall be set with the tracer wire stubbed up inside.	
END OF SECTION	
<b>Earthwork</b>	<b>2.04</b> Page 10
A. The CONTRACTOR shall grade the site to achieve the elevations as shown on the Plans. All disturbed areas beyond the grading limits shall be restored to prior condition.	
B. Surplus excavated material not needed for embankment shall be disposed of by the CONTRACTOR. Headwalls, culverts, drains, sewers and appurtenances filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, repaired, or replaced at his expense.	
C. All temporary earth changes shall be in conformance with the Soil and Erosion Control Act.	
<b>3.14 RESTORATION</b>	
A. Headwalls, culverts, and drainage systems filled or damaged by the CONTRACTOR during the course of his operations shall be cleaned, raised or rebuilt with new materials to a condition equal to the original state, and of thickness equal to the original structure and to the original line and grade at the CONTRACTOR'S expense.	
B. Where the excavation is located beside a ditch and/or where an existing ditch is filled or disturbed in the CONTRACTOR'S operations, the CONTRACTOR shall clean, repair, or replace the ditch with properly pitched bottom and side slopes and of section and capacity not less than the original section.	
C. Where excavation has been through lawn areas, the CONTRACTOR shall restore the disturbed area by placing topsoil and seeding or sodding over the final backfill material.	
D. The CONTRACTOR shall remove excess dirt and other construction material from the site of the work and leave the site in a condition equal to its original state.	
E. The final condition of the streets and roadways shall be subject to the approval of the governmental body having jurisdiction thereof, as well as review by the ENGINEER.	
END OF SECTION	

<b>Sanitary Sewers and Manholes</b>	<b>2.10</b> Page 5
F. Ductile iron pipe shall meet or exceed all the requirements of ANSI A21.50 with a cement lining.	
<b>2.02 SEWER PIPE FITTINGS</b>	
A. Fittings shall be of the same material as the pipe, and in no case shall the walls be thinner than that of the pipe furnished.	
B. Wye and tee fittings for PVC pipe shall be reviewed by the ENGINEER before purchasing.	
C. The dry fit of all fittings must be snug. If the fit is such that it is loose, the pipe or fitting will be rejected as faulty and of improper size.	
<b>2.03 SEWER PIPE JOINTS</b>	
A. Concrete pipe joints shall be made of a resilient material conforming to the latest revision of ASTM Designation C443. Proper lubricant shall be furnished by the joint manufacturer.	
B. Concrete pipe for use with rubber joints shall be smooth and precisely formed to provide a uniform annular space for joint materials.	
C. PVC pipe shall be jointed with ring gusseted bell ends. Jointing materials shall be applied to the bell end of the pipe at the point of manufacture in such a manner that a tight uniform joint will be achieved and such that when the joint is made up in the field, the joint material will not roll or tear from the pipe. A proper joint lubricant shall be furnished by the pipe manufacturer.	
<b>2.04 REINFORCED CONCRETE MANHOLES</b>	
A. Manholes shall conform to the current ASTM specifications for precast reinforced concrete manhole sections, serial designation C478. Manhole section joints shall conform to ASTM C990-96. Cone sections shall be straight side type, with an offset step configuration.	
B. All manhole component parts shall have the name of the manufacturer stenciled on the inside. The lettering or logo shall be a minimum of 4-inches high.	
C. Manholes constructed over an existing sewer line shall have a doghouse mudded to an 8-inch thick cookie. The bottom of the existing pipe shall be the channel. All other manholes shall have precast integral base sections with pre-formed concrete channels.	
D. All channels shall be constructed to the full flow depth of the pipe.	
<b>2.05 MORTAR FOR MANHOLES</b>	
A. Mortar for plastering manholes shall be made of one part Portland cement and two parts fine aggregate.	
<b>2.06 MANHOLE FRAMES AND COVERS</b>	
A. Manhole frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each cover shall be marked with the Pittsfield Township logo and the letters, "PITTSFIELD TWP SANITARY SEWER" integrally cast into the cover.	
Pittsfield 230018.00.0000	06/15/04

**AS-BUILT PLANS PREPARED BY:**

DAVID ARTHUR  
CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

DAVID A. KUBISKE  
ENGINEER  
NO. 35793  
LICENSED PROFESSIONAL ENGINEER

C.S.P.A. #96-22

REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
TWP	7/11/05	GM
WCRC/TWP/WCDC	1/17/05	GM
WCRC/TWP	6/21/04	GM
REV. TWP/WCRC		GM
DRAWN BY	DESIGNED BY	DATE
GM		3/31/04
ST. JAMES WOODS II		
STANDARD SPECIFICATIONS		
SCALE	JOB NO.	
HOR 1" =	00068	
VER 1" =	SHEET NO.	
FIELD BOOK NO.	37B OF 42	
E.P. KUBISKE & ASSOCIATES, INC.		
1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734) 481-1322 FAX (734) 481-2215		

**AS-BUILT** THIS SHEET DOES NOT CONTAIN FIELD MEASURED / AS-BUILT INFORMATION

SECTION 2.09	WATER MAIN	2.09 Page 1
1.00	GENERAL	
1.01	DESCRIPTION	
A.	The CONTRACTOR shall furnish all labor, materials, and equipment required to construct water main, and all necessary appurtenant work as herein specified. The water main shall be installed in the locations as shown on the Plans and shall meet the line acceptance tests.	
1.02	TESTING	
A.	General	
1.	Furnish all equipment and personnel to conduct system acceptance tests as specified herein. All tests shall be conducted under the supervision of the ENGINEER. No acceptance tests shall be conducted until the entire system is constructed or just prior to placing the system in service, providing the water main has been installed and backfilled for not less than 30 days.	
2.	All water mains, branches, and valves shall be tested for pressure, leakage and disinfection.	
3.	Should the results of any test fail to meet the criteria established in this Specification, the CONTRACTOR shall at his own expense, locate and repair rejected section and retest until it is within specified allowance.	
4.	Provide all labor, supervision, pumps, measuring devices, power and other materials and equipment necessary for conducting acceptance tests on all piping.	
B.	Preparation	
1.	After the pipe has been laid and backfilled as specified, the CONTRACTOR shall fill the line, or a valve section thereof, to be tested with water in such a manner as to expel all air from the pipe. This may be done through fire hydrants at the high points; or, if no hydrant is available at such point, the CONTRACTOR shall make the taps necessary to accomplish the expulsion of all air. At the close of the test, all taps shall be satisfactorily plugged with brass plugs.	
2.	Only Pittsfield Township personnel or the CONTRACTOR under direct supervision of Pittsfield Township personnel may fill or flush lines.	
C.	Sequence	
1.	All water mains connected to an existing water system shall be flushed, chlorinated and bacteriologically tested prior to pressure testing. The sequence for acceptance testing shall be: <ul style="list-style-type: none"> <li>a. Flushing</li> <li>b. Chlorination</li> <li>c. Flushing</li> <li>d. Bacteriological Testing</li> <li>e. Pressure Testing</li> </ul>	
2.	Where mains can be totally isolated from the existing water system with airgaps, pressure testing shall precede chlorination and bacteriological testing. The sequence for acceptance testing shall be:	
Pittsfield 230018.00.0000 06/20/05		

Water Main	2.09 Page 2
a.	Pressure Testing
b.	Connect to System
c.	Flushing
d.	Chlorination
e.	Flushing
f.	Bacteriological Testing
D.	Flushing
1.	Mains shall be flushed with clean potable water until the water runs clear. When flushing mains prior to chlorination, all hydrant heads, operating stems and hydrant valve mechanisms shall be removed.
E.	Chlorination
1.	All new mains and pipe or any existing mains contaminated by the CONTRACTOR shall be chlorinated to a minimum residual chlorine concentration of fifty (50) parts per million with commercial liquid chlorine solution or approved equal. The chlorinated water shall be allowed to stand in the mains for 24 hours. The end of the 24-hour period the chlorinated water at all parts of the mains shall show a free available chlorine residual of not less than twenty-five (25) parts per million. If less than twenty-five (25) parts per million residual is shown at the end of the first 24 hours period, additional chlorine shall be added until a residual of not less than twenty-five (25) parts per million at all parts of the system is shown after a subsequent 24 hour period. The chlorinated water shall then be removed from the mains and the mains flushed with potable water for bacteriological testing.
F.	Bacteriological Testing
1.	The OWNER will take bacteriological samples of the water in the mains for analysis at two different times. The first samples will be taken 24 hours after the mains have been satisfactorily chlorinated, flushed and filled with potable water. The second sample will be taken 24 hours later. Each sample will be incubated for 48 hours.
2.	The CONTRACTOR shall provide a sufficient number of corporation cocks and copper tubing for taking samples. Samples shall not be collected from hoses or fire hydrants.
3.	Bacteriological testing will begin on Mondays to afford Pittsfield Township personnel and the testing laboratory a full work week to conduct the testing.
G.	Pressure Testing
1.	All pipe laid under this Contract shall be subjected to a hydrostatic pressure of 150 psi based on the elevation of the lowest point in the system. The main shall be maintained under the test pressure for a minimum continuous period of two (2) hours by pumping potable water into the line at frequent intervals. The volume of water so added shall be measured and considered to represent the leakage from the main. No pipeline installed will be accepted until the leakage measured over a 1 hour period is less than 0.022 gallon per inch diameter of the pipe per 1000 feet. All visible leaks must be corrected. The maximum length of water main to be tested at one time shall be 2000 feet.
2.	In the event that the leakage exceeds the specified amount, the main shall be carefully inspected for leaks and repaired as necessary. Any cracked or defective pipe, fittings, valves or hydrants discovered shall be removed and replaced with sound material at the
Pittsfield 230018.00.0000 06/20/05	

Water Main	2.09 Page 3														
CONTRACTOR's expense and the test repeated to the satisfaction of the ENGINEER and OWNER.															
3.	If the CONTRACTOR chooses to pressure test against an existing valve he assumes the responsibility of meeting the leakage requirements. The CONTRACTOR may at his discretion provide a physical break and cutting in sleeve for pressure testing.														
H.	Material Tests														
1.	The CONTRACTOR shall have test of pipe and strength made by an independent testing laboratory. Tests of up to 4 lengths of sewer pipe per hundred lengths may be required to show compliance with the Specifications. All pipe delivered to the job site shall be accompanied with a manufacturer's certificate of compliance to the specifications.														
1.03	SUBMITTALS														
A.	The CONTRACTOR shall submit shop drawings or data sheets for all pipe, manholes, manhole castings, pipe to manhole connections and valves. The Contractor shall submit certification letter for all pipe proposed on the project. The letters shall contain the following: Contractor name, project name, township name, current date, certification of pipe provided and letterhead of the certifying company.														
2.00	PRODUCTS														
2.01	PIPE AND FITTINGS														
A.	Ductile iron pipe water main shall meet all the requirements of the latest revision of the American National Standards Institute Specifications, A21.51 and the American Water Works Association (AWWA) Specification C151. All joints including joints for valves and hydrants shall be "push on." Pipe shall be furnished in 18 or 20 ft lengths, unless otherwise required. The pipe shall meet the thickness class requirements shown in the table below.														
<table border="1"> <thead> <tr> <th>Nominal Inside Diameter</th> <th>Thickness Class</th> </tr> </thead> <tbody> <tr><td>4</td><td>54</td></tr> <tr><td>6</td><td>54</td></tr> <tr><td>8</td><td>54</td></tr> <tr><td>10</td><td>54</td></tr> </tbody> </table>		Nominal Inside Diameter	Thickness Class	4	54	6	54	8	54	10	54				
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Pittsfield 230018.00.0000 06/20/05															

Water Main	2.09 Page 4
B.	Pipe shall withstand a working pressure of 125 psi plus a 100 psi surge pressure.
C.	Pipe shall be double cement-lined and seal coated with an approved bituminous seal coat in accordance with ANSI Specification A21.4 (AWWA C-104).
D.	Ductile iron or cast iron fittings shall meet all the requirements of the latest revision of the American National Standards Institute Specification A21.10 for a working pressure of 125 psi and be of the push-on joint type. Plugs, where shown on the Plans, shall be solid mechanical joint plug type.
E.	Mechanical joints, shall be in conformity with the requirements of the latest revision of the American National Standards Institute A21.11. All bolts located below grade shall be type 304 stainless steel.
F.	Push-on joints shall meet all the requirements of AWWA Specification C111. Push-on joints shall consist of a ductile iron bell provided with a recess to receive a circular molded rubber gasket to effect the joint seal. A rubber gasket and sufficient lubricant to assemble the joint shall be furnished with each joint. The lubricant shall have no deleterious effect upon the color, taste or odor of potable water and shall not be corrosive to either the pipe or gasket. Pipe furnished with push-on type joints shall be equal in strength and leak tightness to pipe furnished with mechanical joints as specified when installed under identical conditions, and shall meet all other requirements of these Specifications. In addition to the above requirements, the gasket and lubricant shall conform to the latest revision of the ANSI Specification A21.11.
G.	All pipe and fittings shall be manufactured in the United States of America.
2.02	VALVES
A.	All valves installed under this Specification shall conform to the applicable requirements of AWWA C500, C504, and C509 standards governing construction materials and workmanship. Each valve shall carry the name or trademark of the manufacturer. All valves shall have operating nuts that turn to the right (clockwise) to open.
B.	Resilient-Seated Gate Valves
1.	Resilient seated gate valves shall have a cast or ductile iron body and bonnet. Valves shall have a minimum non-shock W.O.G. working pressure of 200 psi. The wedge shall be ductile iron encased in a bonded-in-place styrene-butadiene elastomer covering to form resilient seating surfaces. Stem shall be bronze of non-rising design with double o-ring packing.
2.	Resilient seated gate valves shall be used for all mains.
3.	Resilient seated gate valves shall be manufactured by American Flow Control or Clow.
C.	Swing Check Valves
1.	Valves shall have a cast or ductile iron body and bolted cap with a minimum non-shock W.O.G. working pressure of 150 psi. Seats shall be bronze and shall be screwed into the valve body. The disc shall be bronze or cast iron with permanently rolled in bronze faces. The disc hinge pin shall be aluminum bronze or stainless steel riding in bronze bushings, one on each side of the valve. Valves shall have ANSI 125 pound standard drill flat faced flanges unless otherwise specified or shown on the Plans. Valves shall have outside weighted arm.
Pittsfield 230018.00.0000 06/20/05	

Water Main	2.09 Page 5
D.	Air Release Valves
1.	Air release valves when specified shall be designed to operate under a maximum operating pressure of 300 psi and capable of venting 200 CFFAS (cubic feet of free air per second). Valves shall be cast iron with bronze internal parts and Type 304SS float.
E.	Corporation Stops
1.	One-inch corporation stops used for insertion into mains shall be Ford F600 or FB600, or equal. All stops shall have bronze cast bodies, keys, stem washers and nuts. Inlet threads shall conform to the latest revision of AWWA C800. The outlet connection shall be able to receive the flared end of the copper service pipe. All stops 1-1/2-inch and larger shall be of ball plug design.
F.	Valve Boxes
1.	Valve boxes 5-1/4" shall be of cast iron construction. They shall be of three piece, screw type adjustment design. All valve boxes shall be installed flush with the top of the proposed site grade. Covers shall be designed to be removed easily to provide access to the valve. The base shall not rest upon the valve assembly. All valve boxes shall be Tyler Pipe 6860 Item D with a number 6 base.
2.03	GATEWELLS
A.	Gatewells shall conform to the current ASTM specifications for precast reinforced concrete manhole sections, serial designation C478. Section joints shall be rubber gasketed and conform to ASTM C990-96. Cone sections shall be straight side type, with an offset step configuration.
B.	All gatewell component parts shall have the name of the manufacturer stenciled on the inside. The lettering or logo shall be a minimum of 4-inches high.
C.	Gatewells constructed over an existing water main shall have a doghouse mudded to an 8-inch thick cookie. All other gatewells shall have precast integral base sections.
D.	Mortar for plastering gatewells shall be made of one part Portland cement and two parts fine aggregate.
2.04	GATEWELL FRAMES AND COVERS
A.	Gatewell frames and covers shall weigh not less than 350 lbs. Each frame and cover shall have machined bearing surfaces and shall be suitably notched for convenient removal of the cover. Each cover shall be marked with the Pittsfield Township logo and the letters, "PITTSFIELD TWP WATER" integrally cast into the cover.
B.	Frames and covers shall be East Jordan 1040Z, with Type A cover.
C.	All gatewell frames and covers shall be coated by the manufacturer with coal tar pitch varnish or other asphaltum coating reviewed by the ENGINEER.
2.05	MANHOLE STEPS
A.	Steps shall be plastic coated steel. They shall be M.A. Industries PS1-PF or PS1-B, or approved equal.
Pittsfield 230018.00.0000 06/20/05	

Water Main	2.09 Page 6
2.06	GATEWELL CONNECTIONS
A.	Water pipe (6-inch to 24-inch) to manhole connections shall be through: 1) a flexible rubber boot which shall be securely clamped into a core-drilled pipe port. Pipe ports shall be core-drilled at the point of manhole manufacturer and shall be accurately located within 1/2-inch of proposed sewer centerline (Kor-N-Seal); or, 2) a self-adjusting mechanical pipe to manhole seal which provides a resilient flexible and infiltration-proof joint (Res-seal); or, 3) a flexible rubber wedge firmly rammed into a rubber gasket which is cast into the manhole (Press Wedge II), or equal. All flexible pipe to manhole connections shall be installed per the manufacturer's specifications.
B.	Neoprene rubber for the manhole boot shall meet ASTM Specification C443 and shall have a minimum thickness of 3/8-inch. Pipe clamp bands shall be of corrosion-resistant steel.
C.	Water pipe over 24 inches to gatewell connections shall be in accordance with details shown on the Plan.
2.07	Gatewell Adjustments
A.	All final grade adjustment of gatewell covers and frame assemblies shall be completed utilizing injection molded High Density Polyethylene (HDPE) adjustment rings as manufactured by LADTECH, INC. or approved equal. The adjustment rings shall be manufactured from polyethylene plastic as identified in ASTM Designation D 1248. Brick adjustments are not acceptable.
B.	All adjustment for matching road grade shall be made utilizing a molded indexed slope ring.
C.	Each adjustment ring shall be sealed with a 3/16 to 1/4 inch bead of butyl rubber sealant per the manufacturer's instructions. Sealant shall meet ASTM specification C-990.
D.	All castings and adjustment rings shall be securely fastened to the cone of the structure with four 3/8-inch threaded rods. The rods shall be galvanized or stainless steel anchored to the structure with Redhead concrete anchors or equal. Stainless steel or galvanized nuts and washers shall be used to attach the casting
2.08	SERVICE LEADS
A.	Pipe for service leads 1-inch to 2-inch shall be soft annealed Type K copper.
B.	Curb Stops: One-inch curb stops used for service connections shall be Ford or B22-444 ball valve, McDonald 4713, Mueller B-25204, or approved equal. Curb stops 1-1/2" shall be Ford B22-666, McDonald 6100, or approved equal. Two-inch curb stops shall be B44-777, McDonald 6100-22, or approved equal. All parts shall be cast from bronze. They shall have an inverted key stop. Both inlet and outlet connections shall be able to receive the flared end of the copper service pipe for 1-inch and 1-1/2-inch. Compression fittings shall be used for 2-inch.
C.	Curb Boxes: Curb boxes used for service connections shall be the "Arch" type. All curb boxes shall have an I.D. screw type adjustment and shall be furnished complete with cover, rod, and 2" diameter pentagon boll(s). All curb boxes shall be coated inside and out with a tar base enamel. The minimum bury shall be 5'-0" (60") and the maximum 6' (72"). All curb boxes shall be Ford model EA1-60-40-54R or McDonald model 5601 or 5603.
Pittsfield 230018.00.0000 06/20/05	

Water Main	2.09 Page 7
D.	Couplings:
1.	One-inch and 1-1/2-inch couplings used for service connections located outside the pavement or more than 10 feet from a building shall be Ford C22 or McDonald 4758, or equal. They shall have a three part union, and both inlet and outlet connections shall be able to receive the flared end of the copper service pipe for 1-inch and 1-1/2-inch. Two-inch couplings located outside the pavement or more than 10 feet from a building shall be Ford C44-77 or McDonald 4758-22, or equal, and be a compression or flare type fitting. All parts shall be cast from bronze.
2.	All service connections between two copper service pipes (two-inch or less in diameter) located under the pavement or within 10 feet of a building shall be connected using wrought copper, solder-sweat type couplings conforming to ASME B16.18 or ASME B16.22. Fittings shall bear made in USA labels. Joining of copper piping shall be a solder-sweat connection using lead free Sifos. The use of 95-5, Tin-Antimony or equivalent solders will not be allowed.
2.09	HYDRANTS
A.	Fire hydrants shall comply with the latest revision of AWWA Standard, C502. Hydrants shall be compression type to open with the pressure. They shall have a 5-1/4" valve opening and 6" push-on joint inlet. Hydrants shall have two 3-1/2" (4.05" O.D.) pumper connections with National Standard 7-1/2 threads per inch. All hydrants shall have City of Ann Arbor standard thread pattern.
B.	Fire hydrants shall have inside barrel dimension of not less than 7.375" I.D. from top to bottom. The 1-1/8" pentagon operating nut shall open left (counter clockwise).
C.	All nozzles shall be on a removable head with a flange so that they may be rotated by changing the position of the flange.
D.	Hydrant shall be fully bronze mounted, including top of the operating stem which it passes through the double o-ring seal in the bronze packing gland. The forged operating stem in the base and the valve seat shall also be of bronze. The molded valve shall be of composition rubber and the cast iron valve clamps shall be packed with o-ring seals and held tight to the stem by a threaded bronze hex retainer ring and threaded bronze locknut, anchored with set screws.
E.	Hydrant shall be designed for 150 psi working pressure and tested to 300 psi. Those portions of the hydrant above grade shall have two coats of red enamel. All unpainted surfaces shall have two coats of coal tar pitch varnish.
F.	The hydrants shall be EJJW 5BR-250 with push-on joint connections and break flange barrel.
G.	Hydrant bolts located below grade shall be type 304 stainless steel.
H.	All hydrants shall have a Hydra-Storz adapter. The adapters shall be constructed of a A-356 High Strength Aluminum Alloy, painted orange. The Storz sealing surface shall have a machined metal seat. The threads and metal seat area shall be Teflon coated. The adapters shall be equipped with a set of Type 302 stainless steel butterfly vanes designed to automatically open, by use of stainless steel torsion spring, with water flow and automatically close when flow is stopped. The adapter shall be installed on the left side of the hydrant when facing the hydrant.
I.	Hydrants adjacent to truck routes on commercial developments shall be protected by bollards.
Pittsfield 230018.00.0000 06/20/05	

Water Main	2.09 Page 8
2.10	TAPPING SLEEVES AND VALVES
A.	Tapping sleeves, when specified, shall be full length of heavy-duty stainless steel construction designed for use with the type of pipe to be tapped. Tapping sleeve body shall be 18-8 type 304 stainless steel. Flange shall be CF8 cast stainless steel. Bolts shall be 304 stainless steel. Gasket shall be full circumferential SBR compounded for water service. Tapping sleeve shall contain a test plug to assure seal prior to tapping. Tapping sleeve shall be JCM Industries type 432, Romac Industries type SST, Ford type Fast or PowerSeal 3490AS or Dresser 630, or approved equal.
B.	Tapping valves shall meet the specifications for gate valves except that the valve shall have a flange compatible with the tapping sleeve. Tapping valves shall be Mueller resilient wedge or equal.
C.	The tapping sleeves and valves shall be subjected to a hydrostatic pressure of 200 psi. The sleeves and valves shall be maintained under the test pressure for a minimum continuous period of 5 minutes by pumping potable water into the sleeve. Upon any visual leakage observed by the ENGINEER, the tapping sleeve and valve shall be adjusted or removed and replaced and the test repeated at the CONTRACTOR's expense to the satisfaction of the ENGINEER.
2.11	TRACER WIRE
A.	Wire to be used for tracer purposes shall be #12 THNN solid single strand copper with blue insulation.
B.	Connections shall be made using 3M DBR-09994 wire connectors, or equal.
2.12	POST INDICATORS AND VALVES
A.	Post indicators, when specified, shall be American Flow Control series A240 or Clow series 2945A with aluminum plates indicating aOPEN or aSHUT. Post indicators shall open left.
B.	Post indicator valves shall be American Flow Control Model 2500 or Clow model F-6120. All valves shall open left.
C.	Post indicators and their corresponding valves must be made by the same manufacturer.
D.	Bollards must be placed to protect post indicators, except as specified by the ENGINEER.
2.13	BOLLARDS
A.	Bollards shall be 4-inch diameter galvanized schedule 40 steel posts 36 to 48 inches high with a minimum depth of 24 inches. The posts shall be set in and filled with 3000 psi concrete. Bollards protecting hydrants and FV's shall be painted red.
2.14	POLYETHYLENE WRAP
A.	Polyethylene wrap shall be 8 mil thick Class C/Ce (black) polyethylene conforming to the most recent AWWA standard specification for Polyethylene Encasement for Ductile Iron Pipe, AWWA C105/A21.5. The wrap shall overlap the joint by 12 inches to either side and be secured to the pipe with polyethylene adhesive tape. All pipe and fittings shall be wrapped and taped.
Pittsfield 230018.00.0000 06/20/05	

**AS-BUILT**  
THIS SHEET DOES  
NOT CONTAIN  
FIELD MEASURED /  
AS-BUILT  
INFORMATION

AS-BUILT PLANS  
PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

C.S.P.A. #96-22

REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
TWP	7/11/05	GM
WCRC/TWP/WCDD	1/17/05	GM
WCRC/TWP	6/21/04	GM
REV. TWP/WCRC		GM
DRAWN BY	DESIGNED BY	DATE
GM		3/31/04

ST. JAMES WOODS II

STANDARD SPECIFICATIONS

E.P. KUBISKE & ASSOCIATES, INC.

1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5905  
CIVIL ENGINEERS & LAND SURVEYORS  
(734)481-1322  
FAX (734)481-2215

SCALE	HOR 1" =	VER 1" =
FIELD BOOK NO.		
JOB NO.	00068	
SHEET NO.	37A OF 42	

**WATER MAIN STRUCTURE SCHEDULE**

NUMBER	DIAMETER	TYPE	CASTING TYPE	RIM ELEVATION	TOP/PIPE ELEVATION	DEPTH (FEET)
				(823.89) F.M.		
9	---	EX. FIRE HYD.	---	823.89 RELOC	818.10	5.50 (TYP.)
10	6'	G.W.	EJW 1040 TYPE "A"	831.48	824.62	5.50 (TYP.)
11	5'	G.W.	EJW 1040 TYPE "A"	831.47	825.50	5.92
12	---	FIRE HYD.	---	831.46	826.09	5.51
13	---	FIRE HYD.	---	831.82	825.91	5.50 (TYP.)
14	6'	G.W.	EJW 1040 TYPE "A"	831.63	825.23	5.50 (TYP.)
16	---	FIRE HYD.	---	831.97	826.35	5.50 (TYP.)
17	5'	G.W.	EJW 1040 TYPE "A"	830.94	824.95	5.50 (TYP.)
18	---	FIRE HYD.	---	831.16	825.60	5.50 (TYP.)
19	6'	G.W.	EJW 1040 TYPE "A"	832.00	825.96	5.50 (TYP.)
21	---	FIRE HYD.	---	831.70	826.01	5.50 (TYP.)
22	5'	G.W.	EJW 1040 TYPE "A"	831.26	825.58	5.50 (TYP.)
23	---	FIRE HYD.	---	832.00	826.30	5.50 (TYP.)
24	6'	G.W.	EJW 1040 TYPE "A"	831.58	824.52	6.11'
26	5'	G.W.	EJW 1040 TYPE "A"	831.71	825.80	5.50 (TYP.)
27	---	FIRE HYD.	---	832.05	826.65	5.50 (TYP.)
28	---	FIRE HYD.	---	832.33	826.65	5.39
29	6'	G.W.	EJW 1040 TYPE "A"	831.86	825.84	5.30
31	5'	G.W.	EJW 1040 TYPE "A"	830.39	824.68	5.50 (TYP.)
32	---	FIRE HYD.	---	830.83	825.30	5.20
33	---	FIRE HYD.	---	830.16	825.02	5.50 (TYP.)
34	6'	G.W.	EJW 1040 TYPE "A"	830.84	824.66	5.50 (TYP.)

**SANITARY SEWER STRUCTURE SCHEDULE**

NUMBER	DIAMETER	TYPE	CASTING TYPE	RIM ELEVATION	INVERT ELEV.	DEPTH (FEET)
EXIST #85A	4'	M.H.	EJW 1040 TYPE "A"	824.88 (PROP.) (823.51) F.M.	E 8" INV. 812.24 N 12" INV. 800.74 W 12" INV. 800.64	F.M. 23.68
9	4'	M.H.	EJW 1040 TYPE "A"	824.31 (829.48) F.M.	8" E = 815.88 8" W = 815.88 6" = 816.54 (61)	F.M. 11.10
10	4'	M.H.	EJW 1040 TYPE "A"	831.00 (831.06) F.M.	6" S = 816.48 (59) 8" E = 814.25 8" W = 814.01 8" N = 814.09	F.M. 16.60
11	4'	M.H.	EJW 1040 TYPE "A"	831.60 (831.18) F.M.	6" N = 823.40 (15) 6" NE = 822.18 (16) 6" SE = 816.44	F.M. 15.13
12	4'	M.H.	EJW 1040 TYPE "A"	831.53 (831.27) F.M.	8" S = 816.40 8" E = 816.08 8" W = 816.10	F.M. 15.63
13	4'	M.H.	EJW 1040 TYPE "A"	831.00 (830.71) F.M.	8" NE = 815.51 6" SW = 820.14 (55) 6" SW = 820.14 (56) 6" SW = 820.14 (57)	F.M. 12.49
14	4'	M.H.	EJW 1040 TYPE "A"	831.00 (831.07) F.M.	8" E = 816.68 8" W = 816.59	F.M. 14.64
15	4'	M.H.	EJW 1040 TYPE "A"	831.20 (831.44) F.M.	8" N = 817.41 8" S = 817.94 8" W = 817.89	F.M. 13.99
15A	4'	M.H.	EJW 1040 TYPE "A"	831.20 (831.25) F.M.	8" N = 818.41 8" S = 818.91	F.M. 12.59
16	4'	M.H.	EJW 1040 TYPE "A"	832.20 (832.14) F.M.	8" NW = 818.48 8" NE = 818.44 8" S = 818.36	F.M. 13.80
17	4'	M.H.	EJW 1040 TYPE "A"	832.00 (831.97) F.M.	6" = 822.06 (25) 6" = 823.46 (26) 6" SE = 816.44	F.M. 12.19
18	4'	M.H.	EJW 1040 TYPE "A"	831.00 (831.71) F.M.	8" NE = 819.03 8" SW = 818.83	F.M. 12.92
19	4'	M.H.	EJW 1040 TYPE "A"	831.40 (831.25) F.M.	6" E = 821.17 (37) 8" NW = 820.16 8" SW = 820.12	F.M. 11.22
20	4'	M.H.	EJW 1040 TYPE "A"	831.00 (831.04) F.M.	6" NW = 823.28 (33) 6" SW = 822.08 (32) 8" SE = 821.10	F.M. 10.04
21	4'	M.H.	EJW 1040 TYPE "A"	832.20 (832.06) F.M.	8" SW = 819.56 8" N = 819.46	F.M. 12.70
22	4'	M.H.	EJW 1040 TYPE "A"	832.00 (831.91) F.M.	8" NE = 819.87 6" SW = 821.18 (48) 6" NW = 822.39 (49)	F.M. 12.03

**AS-BUILT**  
12/18/08

**AS-BUILT LEGEND**

5/18/08 ORIGINAL CONSTRUCTION  
PLAN DESIGN

F.M. AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.



**AS-BUILT PLANS PREPARED BY:**  
DAVID ARTHUR CONSULTANTS, INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



C.S.P.A. #96-9

REVISIONS	DATE	BY
WCRC/TWP	7/25/03	GM
REVISION	2/6/03	GM
REVISION	11/25/02	KMD
8/3/05 GM	10/22/02	KMD
7/11/05 GM	08/30/02	KMD
3/18/05 GM	08/13/02	KMD
1/17/05 GM	06/12/02	KMD
8/2/04 GM	02/13/01	AKF
3/31/04 GM	01/19/01	AKF

**ST. JAMES WOODS II**

**STRUCTURE SCHEDULE  
WATER MAIN  
& SANITARY SEWER**

E.P. KUBISKE & ASSOCIATES, INC.

1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 1'  
VER 1" = 1'  
JOB NO.  
00068  
SHEET NO.  
36 OF 42

ST. JAMES WOODS II  
A PLANNED UNIT DEVELOPMENT  
IN THE NW 1/4 SECTION 20, T3S, R6E,  
PITTSFIELD TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

WATER MAIN LEAD SCHEDULE

UNIT NUMBER	CURB BOX ELEVATION	DISTANCE TO TEMPORARY END
12	829.30	85'
13	830.29	86'
14	831.35	110'
15	832.20	78'
16	832.15	51'
17	832.10	45'
18	831.50	63'
19	831.25	21'
20	831.50	83'
21	831.05	85'
22	831.10	84'
23	831.99	83'
24	832.14	128'
25	832.51	158'
26	832.77	146'
27	832.60	114'
28	832.31	58'
29	831.95	29'
30	832.09	22'
31	831.32	108'
32	831.76	99'
33	831.76	72'
34	831.11	39'
35	831.63	62'
36	830.80	53'
37	831.37	83'
38	831.16	82'
39	830.15	85'
40	831.03	83'
41	832.03	82'
42	831.40	85'
43	831.20	84'
44	831.19	83'
45	831.70	116'
46	831.95	134'
47	832.32	103'
48	832.22	64'
49	832.30	41'
50	831.95	50'
51	831.15	22'
52	831.15	21'
53	831.20	100'
54	831.50	104'
55	831.60	81'
56	831.53	42'
57	831.65	59'
58	831.50	59'
59	831.40	21'
60	830.88	21'
61	830.80	39'

SANITARY SEWER LEAD SCHEDULE

UNIT	LEAD TYPE	MAIN INV. @ LEAD	LEAD INV. @ MAIN	RISER HEIGHT	% SLOPE	LENGTH FT.	TEMPORARY END INV.
12	1	813.58	813.65	8.0'	6.0%	7.0'	823.10
13	1	814.07	814.06	8.5'	6.60%	19.0'	824.02
14	1	816.22	815.90	6.0'	2.29%	34.0'	823.92
15	1	816.47	816.15	N/A	2%	30	824.05
16	1	816.47	816.15	N/A	2%	61	824.02
17	1	816.47	815.98	N/A	2%	107	822.04
18	1	816.28	815.96	N/A	4.02%	130	822.55
19	1	815.08	814.69	N/A	7.09%	98	823.21
20	1	815.72	816.72	6.0'	8.67%	4.0'	823.49
21	1	816.32	816.17	6.0'	2.0%	19.0'	823.53
22	1	817.01	816.99	818.01	4.90%	18.0'	823.57
23	1	818.07	819.05	820.07	9.71%	3.4'	823.00
24	1	818.57	819.50	820.57	5.08%	38	823.43
25	1	819.81	822.06	N/A	2%	22.0'	822.70
26	1	819.81	823.46	N/A	2%	52.0'	824.55
27	1	818.81	819.60	822.48	2%	101.0'	824.60
28	1	818.74	819.59	820.74	2.87%	131.0'	824.50
29	1	818.48	819.38	820.46	2%	124	823.03
30	1	818.08	819.04	820.05	2.12%	92	822.00
31	1	820.66	820.73	821.86	2%	36	822.44
32	1	821.16	821.6	822.16	2%	31.0'	822.78
33	1	821.16	823.28	N/A	2%	36	823.90
34	1	821.16	820.96	822.28	2%	46.0'	823.96
35	1	821.08	820.94	822.08	2%	129.0'	824.66
36	1	820.70	820.67	821.80	2.61%	115	822.95
37	1	820.18	821.18	N/A	2.69%	39.0'	822.03
38	1	820.08	820.02	821.05	6.33%	15	822.06
39	1	818.69	819.70	820.69	N/A	15	822.01
40	1	818.33	819.45	820.33	1.00%	4.79%	821.90
41	1	818.77	818.80	819.77	3.0%	2.30%	823.04
42	1	818.11	818.04	819.11	2.5'	8.26%	822.05
43	1	818.18	818.33	819.16	3.0'	7.0%	822.99
44	1	818.61	818.99	819.81	2.8'	5.52%	823.38
45	1	818.28	819.20	820.26	2.0'	9.69%	822.38
46	1	818.68	819.61	820.65	N/A	1.5'	822.74
47	1	818.42	819.88	821.80	2%	28.0'	822.45
48	1	819.97	821.78	821.74	N/A	2%	822.42
49	1	819.97	822.38	822.35	3.0'	2.38%	827.65
50	1	818.18	819.16	820.19	N/A	2.00%	823.14
51	1	818.68	819.02	819.85	N/A	2.00%	821.48
52	1	818.58	818.57	819.36	N/A	2.00%	821.01
53	1	818.10	818.15	819.10	2.0'	4.52%	822.52
54	1	818.51	818.49	821.88	N/A	3.0'	822.58
55	1	818.51	821.78	821.90	N/A	2%	822.62
56	1	818.51	820.74	820.90	N/A	2%	822.56
57	1	818.51	818.48	819.94	N/A	2%	822.51
58	1	818.18	818.18	819.13	N/A	2.67%	822.42
59	1	814.50	818.68	819.56	N/A	2%	821.52
60	1	814.08	814.57	815.05	N/A	9.58%	822.98
61	1	813.30	816.54	816.54	N/A	2%	818.87

STORM SEWER LEAD SCHEDULE

UNIT NUMBER	TYPE	PERCENT OF SLOPE	INVERT AT MAIN	INVERT AT TEMPORARY END	DISTANCE TO TEMPORARY END
23	2	1.00	822.69	823.21	35' @ MH
24	2	1.00	822.69	823.36	33' @ MH



AS-BUILT PLANS PREPARED BY:  
DAVID ARTHUR CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

AS-BUILT  
12/18/08

AS-BUILT LEGEND  
ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

C.S.P.A. #96-22

REVISIONS	ITEM	DATE	BY
	WCRC/TWP	7/25/03	GM
	WCRC	5/22/03	GM
	TWP	5/07/03	GM
	REVISION	2/6/03	GM
7/11/05	REVISION	11/25/02	KMD
3/19/05	REVISION	10/22/02	KMD
1/17/05	REVISION	08/30/02	KMD
8/2/04	REVISION	08/13/02	KMD
3/31/04	REVISION	06/12/02	GM

ST. JAMES WOODS II

LEAD SCHEDULE

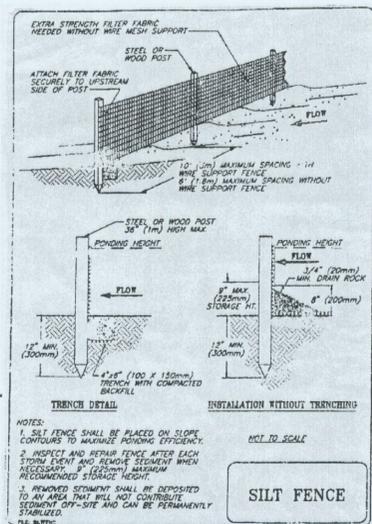
E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5908  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 1"  
VER 1" = 1"  
JOB NO. 00068  
SHEET NO. 35 OF 42

MICHIGAN UNIFIED KEYING SYSTEM

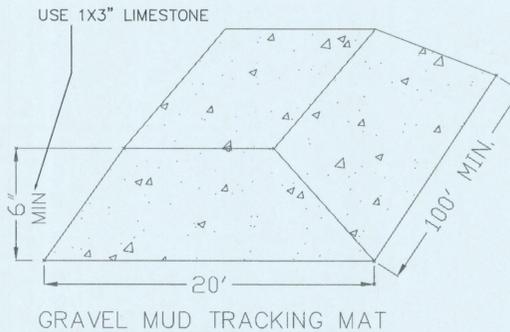
\* Indicates applicability of a specific control measure to one or more of the seven problem areas

KEY	DETAIL	CHARACTERISTICS	A	B	C	D	E	F	G
2	Diversion Ditch & Stone	WATER CAN BE DIVERTED TO MINIMIZE EROSION PLASTER SLOPES (SEE DESIGN PROBLEMS)	*					*	*
7	Hydro-seeding	EFFECTIVE ON LARGE AREAS. MULCH FACINGS AGENT USED TO PROVIDE IMMEDIATE PROTECTION UNTIL GRASS IS ROOTED SHOULD INCLUDE PREPARED TOPSOIL. SEE	*					*	*
15	Pinning	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED BUT INCREASES RUNOFF VOLUME AND VELOCITY. IRREGULAR SURFACE WILL HELP SLOW VELOCITY	*					*	*
16	Curb & Gutter	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE. COLLECTS AND CONVEYS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAYS						*	*
36	Catch Basins, Drop Inlets	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF. MAY USE FILTER CLOTH OVER INLET						*	*
54	Silt Fence	USES GEOTEXTILE FABRIC AND POSTS OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY	*	*	*	*	*	*	*
43	Riprap, Rubble, Subsoil	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED. EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS. PERMITS "RUNOFF" TO INFILTRATE. SOIL DISSIPATES ENERGY. FLOW AT SYSTEM OUTLETS	*	*	*	*	*	*	*
1*	Stockpiles & Storage Piles	TOPSOIL MAY BE STOCKPILED AROUND BARRIERS TO ACT AS A DIVERSION. STOCKPILES SHOULD BE TEMPORARILY SEEDED	*	*	*	*	*	*	*



SOIL EROSION / SEDIMENTATION CONTROL OPERATION TIME SCHEDULE

CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
INSTALL SEDIMENT FENCE & TREE PROTECTION FENCING PRIOR TO ANY GRADING OPERATION			X									
INSTALL MUD TRACKING PAD			X									
CONSTRUCT RETENTION BASIN					X	X						
PLACE TOPSOIL, FERTILIZER, SEED, AND MULCH OVER THE ENTIRE RETENTION AREA					X	X						
ROUGH GRADE SITE, STOCKPILE TOPSOIL, AND BEGIN BUILDING CONSTRUCTION							X	X				
INSTALL STORM DRAINAGE SYSTEM INCLUDING RIP-RAP AND INLET FILTERS					X	X	X	X	X	X		
MAINTAIN EROSION AND SEDIMENTATION CONTROL MEASURES, AS REQUIRED			X	X	X	X	X	X	X	X		
INSTALL SANITARY SEWER AND WATER SYSTEMS					X	X	X					
BRUSH PAVEMENT AREAS TO SUB-BASE GRADE, PLACE SUB-BASE AND BITUMINOUS SURFACING							X	X	X			
INSTALL FRANCHISED UTILITIES												
FINISH GRADE, REDISTRIBUTE TOPSOIL, SEED AND MULCH DISTURBED AREAS							X	X	X			
COMPLETE CONSTRUCTION OF SITE									X	X		
INSURE ALL SOIL IS STABILIZED, REMOVE ALL TEMPORARY SOIL EROSION CONTROL MEASURES										X	X	



PITTSFIELD CHARTER TOWNSHIP SOIL EROSION AND SEDIMENTATION CONTROL NOTES

GENERAL

- The contractor shall implement and maintain the soil erosion control measures as shown on the plans at all times during construction on this project. Any modifications or additions to the soil erosion control measures due to construction or changed conditions, shall be complied with as required or directed by the owner, project engineer or Pittsfield Township.
- All soil erosion and sedimentation control work shall conform to the permit requirements of Pittsfield Township and the laws of the State of Michigan.
- A NPDES construction activity permit is required for all sites greater than 5 acres.
- Daily inspections shall be made by the contractor. Periodic inspections may be made by the owner/project engineer/Township to determine the effectiveness of erosion and sedimentation control measures. Any necessary corrections shall be made without delay.
- Erosion and sedimentation from work on the site shall be contained on the site and not be allowed to collect on any off-site areas or in waterways.
- All mud/dirt tracked onto roads from the site due to construction, shall be promptly removed by the contractor.
- Restoration of all disturbed areas, including placement of topsoil, seed, fertilizer and mulch and/or sod shall be done within 5 days of the completion of final grade.
- Construction operations shall be scheduled and performed so that preventative soil erosion control measures are in place prior to excavation in critical areas and temporary stabilization measures are in place immediately following backfilling operations.
- Special precautions will be taken in the use of construction equipment to prevent situations that promote erosion.
- Proper dust control shall be maintained during construction by use of water trucks and/or chloride as required.
- The contractor shall be responsible for maintaining all temporary soil erosion control measures and removal of some upon authorized completion of project. Completion of project will not be authorized until all site work, home building, road work and utility construction is complete and all soils are stabilized.
- The contractor shall not grade in existing wetland or conservation areas to be protected. Silt fence shall be installed and maintained adjacent to existing wetland and conservation areas to prevent grading, erosion and sedimentation into them.
- Tree protection fencing must remain intact until restoration of the site is complete.

CATCH BASIN/MANHOLE PROTECTION

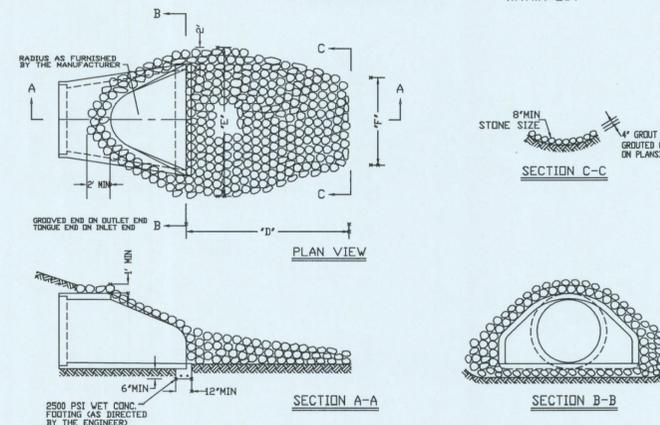
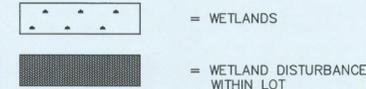
- Protect storm sewer catch basins with Dandy Products Inc. or approved equivalent as follows:
  - Dandy Bag for 1040 storm covers.
  - Beaver Dam for all curb structures.
  - Dandy Sock over all detention pond outlet structures.

ROADS

- During construction, all roads shall be protected from unvegetated areas washing onto road surfaces by placement of silt fence behind curb or a 10 foot wide straw mulch bank behind the curb or other approved method and/or as shown on the plans.
- During construction of any portion of the project, roads shall be maintained free of dirt, silt and construction debris.

SEEDING/SOD

- Seed or sod in accordance with project specifications.
- All areas of disturbed earth that are not to be paved or sodded shall have 4 inches of topsoil, seed, fertilizer and mulch.
- Immediately after seeding, mulch all seeded areas with unweathered small grain straw (preferably wheat) or hay spread. Spread uniformly at the rate of 1 1/2 to 2 tons or 100 pounds (2 to 3 bales) per 1,000 square foot. This mulch should be anchored with a disc-type mulch-anchoring tool.
- Any disturbed area not paved, seeded or mulched, sodded or built upon by November 15, is to be mulched in the manner as specified above, in order to provide soil erosion protection during the winter and early spring.
- All erosion and sedimentation control prevention procedures and structures are to comply with the Standards and Specifications for soil erosion and sediment control of the Washtenaw County Soil Conservation District.



- SPECIAL NOTES
- All Ditches shall be stabilized with 2' CFX sod.
  - DRAINAGE DITCHES AND SLOPES STEEPER THAN 1:4 (25%) STABILIZED WITH EROSION CONTROL BLANKET
  - STEEP SLOPES THAT DO NOT TAKE UPON INITIAL SEEDING MUST BE RE-SEEDING AND STABILIZED WITH EROSION CONTROL BLANKETS
  - A FIELD PRE-CONSTRUCTION MEETING MUST BE HELD PRIOR TO ANY EARTH CHANGE EVENT.
  - THE CONTRACTOR IS RESPONSIBLE FOR THE MAINTENANCE OF ALL PERMANENT SOIL EROSION AND SEDIMENTATION CONTROL MEASURES.

- LANDSCAPING NOTES:
- STABILIZATION MUST BE STARTED WITHIN 5 DAYS OF FINAL GRADE. USE 3-4" TOPSOIL MINIMUM.
  - WHERE EXCAVATION HAS BEEN THROUGH LAWN AREAS, THE CONTRACTOR SHALL RESTORE THE DISTURBED AREA BY PLACING TOPSOIL AND SEEDING OR SODDING OVER THE FINAL BACKFILL MATERIAL.
  - THERE ARE NO EXISTING TREES THAT WILL BE SAVED. THEREFORE NO TREE PROTECTION FENCING IS SHOWN.

PIPE DIA	"D"	"E"	"F"	"SYD"
12"	5'-0"	6'-6"	9'-0"	4
15"	5'-0"	7'-0"	9'-0"	4
18"	5'-0"	7'-6"	9'-0"	4
24"	6'-0"	8'-6"	10'-0"	6
30"	7'-0"	9'-6"	10'-0"	8
36"	8'-0"	10'-6"	10'-0"	10
42"	9'-0"	11'-6"	10'-0"	12
48"	10'-0"	13'-0"	10'-0"	14

RIPPRAP PROTECTION, WHERE CALLED FOR, SHALL BE PLAIN OR GROUDED (AS NOTED ON THE PLANS) AND INSTALLED AS PROVIDED BY MDDT SPEC. 6.01.08. RIPPRAP MATERIAL SHALL MEET THE REQUIREMENTS OF MDDT SPEC. 8.19.02.

**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



REVISIONS	REVISIONS	REVISIONS	REVISIONS
DATE	BY	DATE	BY
9/05/08	LIB	7/25/03	GM
8/28/08	LIB	5/22/03	GM
8/7/08	MDK	5/07/03	GM
2/20/07	GM	2/6/03	GM
3/23/06	GM	11/25/02	KMD
7/11/05	GM	10/30/02	KMD
3/18/05	GM	10/22/02	KMD
1/17/05	GM	08/30/02	KMD
8/2/04	GM		
3/31/04	GM	08/13/02	

**ST. JAMES WOODS II**

EROSION CONTROL

E.P. KUBISKE & ASSOCIATES, INC.

1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 100'  
VER 1" = 10'

JOB NO.  
00068

SHEET NO.  
32 OF 42

20'X100' MUD MAT (SEE DETAIL)

60" PROP. R/W

NOTE: SEED AND STABILIZE IMMEDIATELY UPON ACHIEVING FINAL GRADE & FOLLOW WDC APPROVED SPECS.

NOTE: VORTEX STORM CHAMBER TO BE INSPECTED WEEKLY FOR SEDIMENT ACCUMULATION UNTIL SITE IS STABILIZED & WILL CLEAN AS REQUIRED.

NOTE: SILT FENCING AROUND THE LIMITS OF GRADING IS THE SAME FENCE AS THAT AROUND THE STOCKPILING.

NOTE: SILT FENCE SHALL BE INSTALLED AND MAINTAINED AROUND PERIMETER OF STOCKPILE

NOTE: SEED AND STABILIZE IMMEDIATELY UPON ACHIEVING FINAL GRADE & FOLLOW WDC APPROVED SPECS.

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NOTE: SEED AND STABILIZE IMMEDIATELY UPON ACHIEVING FINAL GRADE & FOLLOW WDC APPROVED SPECS.

CENTER PARK WETLAND (5.1 AC.)

CENTER PARK WETLAND (3.69 AC.)

OPEN AREA = 536640 SQ. FT.

DRAIN 66' WD.

RIPPRAP AS ENERGY DISSIPATOR



NOTE:  
 - NO NEW TREES, BERMS, HEADWALLS, PRIVATE SIGNS OR UTILITIES IN R.O.W.  
 - NO HOME-BUILDING CONSTRUCTION TRAFFIC ON NEW ROADS UNTIL BOTH BASE AND LEVELING COURSE ARE IN PLACE.  
 - CONTINUOUS UNDERDRAIN BENEATH CURBS (SUBGRADE)

LEGEND:

STOP SIGN

KEEP RIGHT

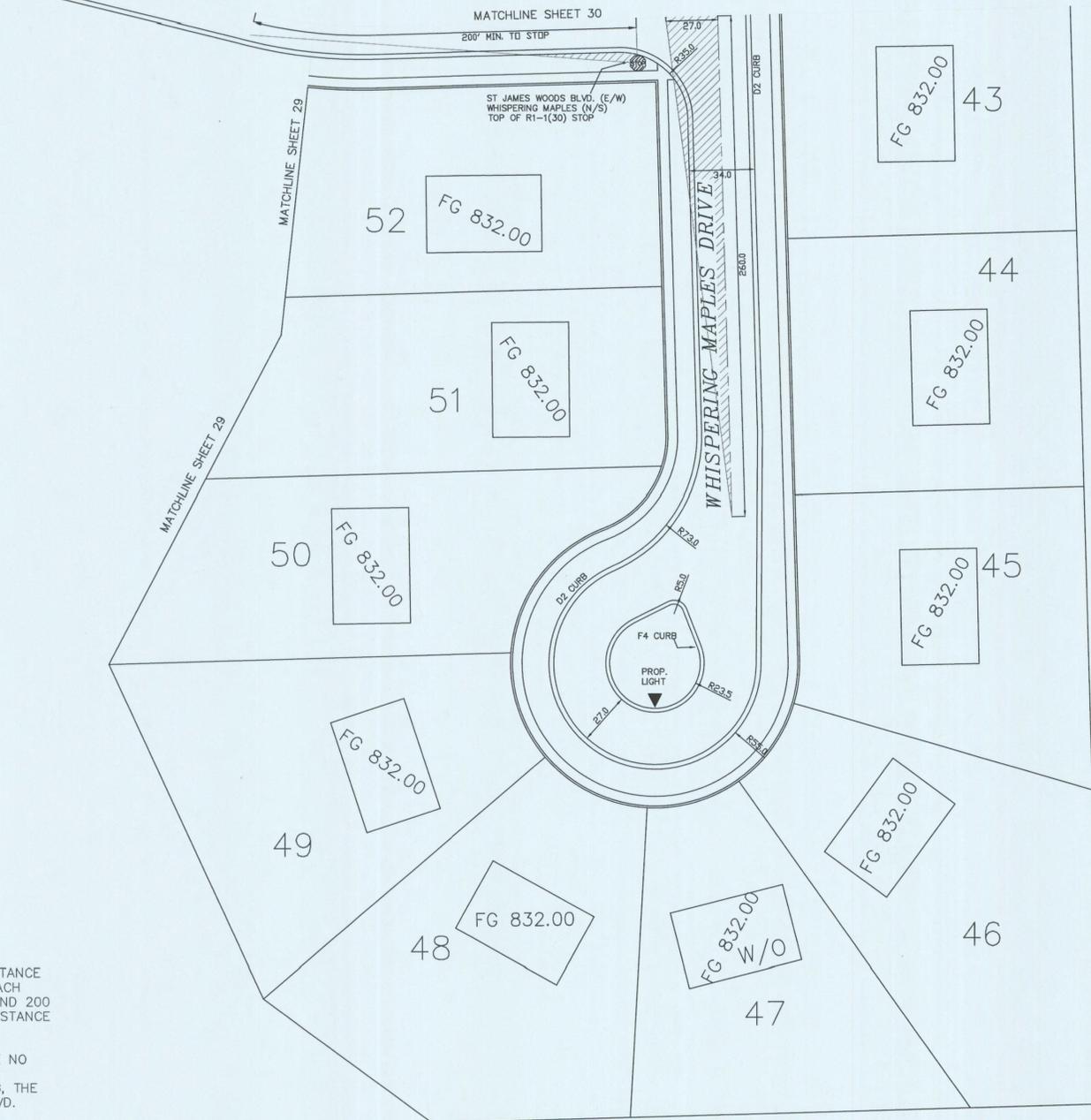
SPEED LIMIT

POST W/ STREET NAMES

260' CLEAR SIGHT DISTANCE

STREET LIGHT

NOTE:  
 LIGHT POLE DETAIL WILL BE PROVIDED BY DETROIT EDISON.



NOTE:  
 A 260' STOPPING SIGHT DISTANCE SHALL BE PROVIDED FOR EACH INTERSECTION APPROACH, AND 200 FEET OF STOPPING SIGHT DISTANCE FOR EACH STOP SIGN.

IN ADDITION, THERE WILL BE NO TREES LOCATED WITHIN ANY HATCHING ON THIS DRAWING, THE TRAFFIC ISLAND AT THE BLVD. INTERSECTION, AND THE CUL-DE-SAC ISLANDS DESPITE WHAT IS SHOWN ON THE ENCLOSED LANDSCAPE PLANS.

ONLY DTE BREAKAWAY LIGHTS WILL BE ALLOWED IN THE R.O.W.

SIGN	SIGN NO.	SIZE	SIGN AREA (12)	SIGN TYPE	NO.	SUPPORT	
						SIZE	TOTAL LENGTH FT. BOT. HT.
	R1-1(30.1)	2.5' x 2.5'	6.25	111A	1	3 lbs	14 7 ft
	R1-1(36.1)	3' x 3'	9	111A	2	3 lbs	30 7 ft
	R2-1(24.1)	2' x 2.5'	5	111B	1	3 lbs	14 7 ft
	R2-1(36.1)	3' x 4'	12	111B	2	3 lbs	32 7 ft
	R4-7(24.1)	2' x 2.5'	5	111B	1	3 lbs	14 7 ft
	R4-7(36.1)	3' x 4'	12	111B	2	3 lbs	30 7 ft

- NOTES:
- TOTAL SUPPORT LENGTHS ARE FOR ESTIMATING PURPOSES ONLY.
  - THE SUPPORT(S) LISTED FOR STANDARD SIGNS SHALL BE USED, UNLESS SHOWN OTHERWISE ON CONTRACT SIGN PLAN SHEETS.
  - ALLOW A VALUE OF H=2 in. FOR INSTALLATIONS WITH COMBINATIONS OF TWO PANELS, AS SHOWN AT LEFT. THIS 2 in. REQUIREMENT DOES NOT APPLY TO RAMP SERVICES SIGNS (E11-15 SERIES) WHICH SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO EACH OTHER.
  - BOTTOM HEIGHT IS DEFINED AS HEIGHT FROM THE NEAR EDGE OF TRAVEL LANE PAVEMENT (EDGE-OF-METAL) TO THE BOTTOM OF THE SIGN PANEL. SEE VIII-120E FOR REQUIRED MINIMUM SIGN BOTTOM HEIGHTS.
- \* 7 ft BOTTOM HEIGHT APPLIES TO PARENT SIGN.

Please add the following to the Construction Traffic Control Notes:

- The Contractor shall provide seven (7) working days notice to the Washtenaw County Road Commission (W.C.R.C.) prior to beginning construction.
- All construction warning signs shall be supplemented with two (2) fluorescent orange warning flags positioned above the sign. Those signs in use during hours of darkness shall also be lighted with two (2) Type A warning flashers. The plastic drums and Type III barricades shall have one (1) and three (3) Type C steady-burning warning lights attached, respectively.
- All traffic control devices including signs, barricades, plastic drums, and warning lights are the responsibility of the Contractor.
- Signs, if required with the Type III barricades, shall be mounted above the barricades on separate supports.
- Traffic control devices are to be maintained by the Contractor for the duration of the project. Night patrols of the construction area and detour route shall be conducted by the Contractor. This will not be paid for separately, but will be considered as having been included in the unit prices bid for temporary traffic control items.
- All traffic control signing shall be in accordance with the latest edition of the "Michigan Manual of Uniform Traffic Control Devices".
- The W20-4, W20-7a, and W20-15 signs shall be covered or taken down when the flagging operation is not being utilized.
- The Contractor shall stake all construction sign locations and notify W.C.R.C. when the staking is complete. The Contractor shall allow two (2) working days for W.C.R.C. to review, adjust, and approve the construction sign staking.
- The construction sign stakes shall indicate the type (code) and size of the sign to be placed at each location. Each stake shall be marked with white flagging ribbon.
- Type III barricades shall consist of twelve (12) foot sections.
- All M4-9 signs shall be supplemented with D3-1 panels.



AS-BUILT PLANS PREPARED BY:

DAVID ARTHUR CONSULTANTS INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

AS-BUILT  
 THIS SHEET DOES NOT  
 CONTAIN FIELD MEASURED /  
 AS-BUILT INFORMATION

REVISIONS		REVISIONS		
DATE	BY	ITEM	DATE	BY
		W.C.R.C./TWP	7/25/03	GM
		W.C.R.C.	5/22/03	GM
		TWP.	5/07/03	GM
		REVISION	2/6/03	GM
8/4/05	GM	REVISION	11/25/02	KMD
7/11/05	GM	REVISION	10/30/02	KMD
3/18/05	GM	BRIDGE AND GRADING REVISIONS	10/22/02	KMD
8/2/04	GM	REVISION	08/30/02	KMD
3/31/04	GM	DESIGNED BY	DATE	
		KMD	08/13/02	

ST. JAMES WOODS II

TRAFFIC CONTROL PLAN

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734)481-1322  
 FAX (734)481-2215

SCALE  
 HOR 1" = 40'  
 VER 1" = 40'

FIELD BOOK NO.  
 JOB NO.  
 00068  
 SHEET NO.  
 31 OF 42



NOTE:  
 - NO NEW TREES, BERMS, HEADWALLS, PRIVATE SIGNS OR UTILITIES IN R.O.W.  
 - NO HOME-BUILDING CONSTRUCTION TRAFFIC ON NEW ROADS UNTIL BOTH BASE AND LEVELING COURSE ARE IN PLACE.  
 - CONTINUOUS UNDERDRAIN BENEATH CURBS (SUBGRADE)

LEGEND:

STOP SIGN

KEEP RIGHT

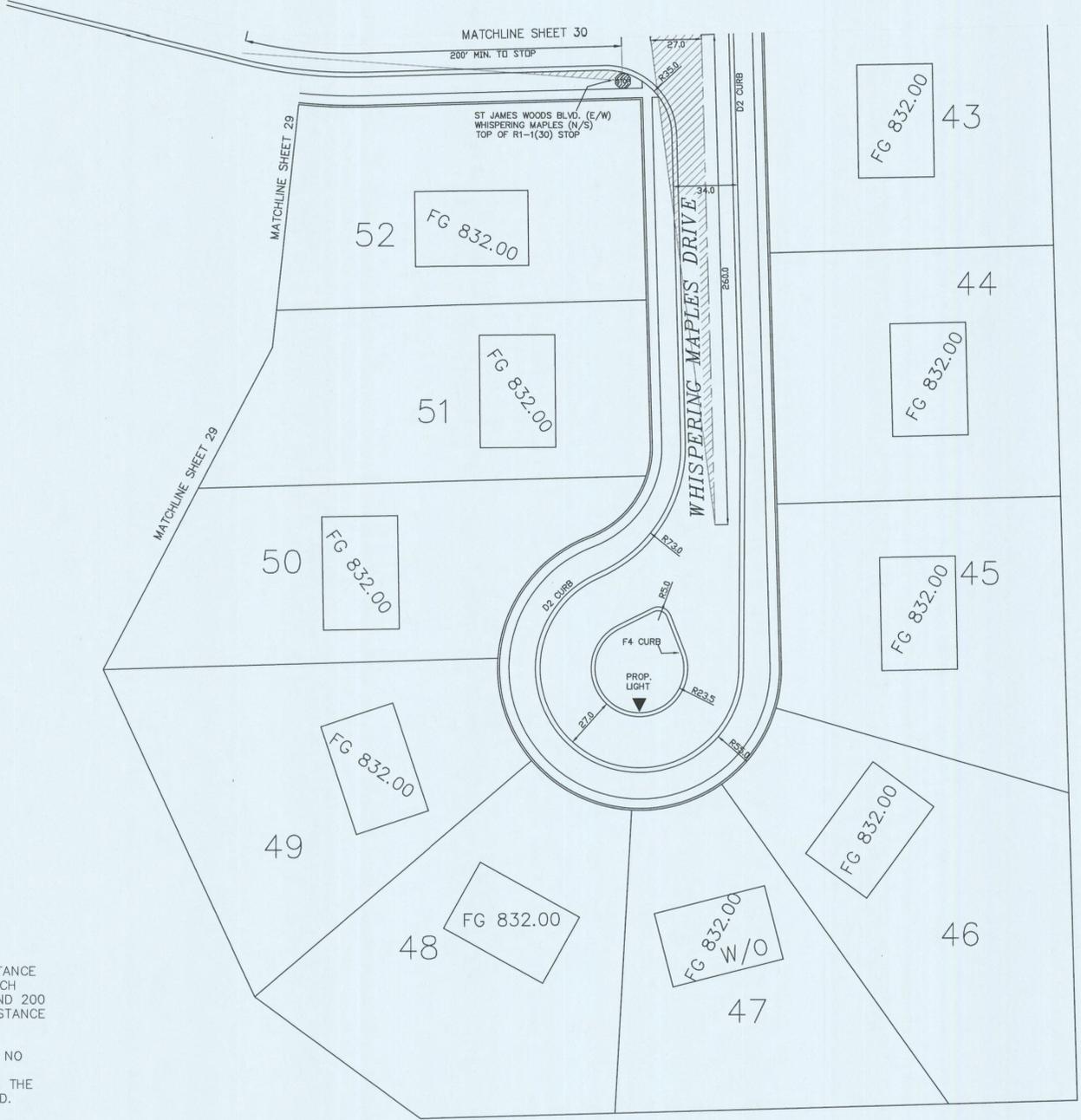
SPEED LIMIT

POST W/ STREET NAMES

260' CLEAR SIGHT DISTANCE

STREET LIGHT

NOTE:  
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NOTE:  
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ONLY DTE BREAKAWAY LIGHTS WILL BE ALLOWED IN THE R.O.W.

SIGN	SIGN NO.	SIZE	SIGN AREA FT <sup>2</sup>	SIGN TYPE	SUPPORT			
					SIZE	TOTAL LENGTH FT	HT. FT.	
	R1-1130.1	2.5' x 2.5'	6.25	111A	1	3 lbs	14	7 ft
	R1-1136.1	3' x 3'	9	111A	2	3 lbs	30	7 ft
	R2-1124.1	2' x 2.5'	5	111B	1	3 lbs	14	7 ft
	R2-1136.1	3' x 4'	12	111B	2	3 lbs	32	7 ft
	R4-7124.1	2' x 2.5'	5	111B	1	3 lbs	14	7 ft
	R4-7136.1	3' x 4'	12	111B	2	3 lbs	30	7 ft

NOTES:

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- BOTTOM HEIGHT IS DEFINED AS HEIGHT FROM THE NEAR EDGE OF TRAVEL LANE PAVEMENT (EDGE-OF-METAL) TO THE BOTTOM OF THE SIGN PANEL. SEE VIII-120E FOR REQUIRED MINIMUM SIGN BOTTOM HEIGHTS.

\* 7 ft BOTTOM HEIGHT APPLIES TO PARENT SIGN.

Please add the following to the Construction Traffic Control Notes:

- The Contractor shall provide seven (7) working days notice to the Washtenaw County Road Commission (W.C.R.C.) prior to beginning construction.
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- All M4-9 signs shall be supplemented with D3-1 panels.



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
 CONSULTANTS INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

**AS-BUILT**  
 THIS SHEET DOES NOT  
 CONTAIN FIELD MEASURED /  
 AS-BUILT INFORMATION

REVISIONS		REVISIONS			ST. JAMES WOODS II	
REVISIONS	DATE	ITEM	DATE	BY	SCALE	
		W.C.R.C./TWP	7/25/03	GM	HOR 1" = 40'	
		W.C.R.C.	5/22/03	GM	VER 1" =	
		TWP.	5/07/03	GM	FIELD BOOK NO.	
		REVISION	2/6/03	GM		
8/4/05	GM	REVISION	11/25/02	KMD		
7/11/05	GM	REVISION	10/30/02	KMD		
3/18/05	GM	DRAINAGE AND GRADING REVISIONS	10/22/02	KMD		
8/2/04	GM	REVISION	08/30/02	KMD		
3/31/04	GM	DRAWN BY	DESIGNED BY	DATE		
		KMD		08/13/02		

TRAFFIC CONTROL PLAN		SCALE
E.P. KUBISKE & ASSOCIATES, INC.		HOR 1" = 40'
1430 E. MICHIGAN AVE.		VER 1" =
YPSILANTI, MI 48198-5908		FIELD BOOK NO.
CIVIL ENGINEERS & LAND SURVEYORS		
(734)481-1322		JOB NO.
FAX (734)481-2215		00068
		SHEET NO.
		31 OF 42

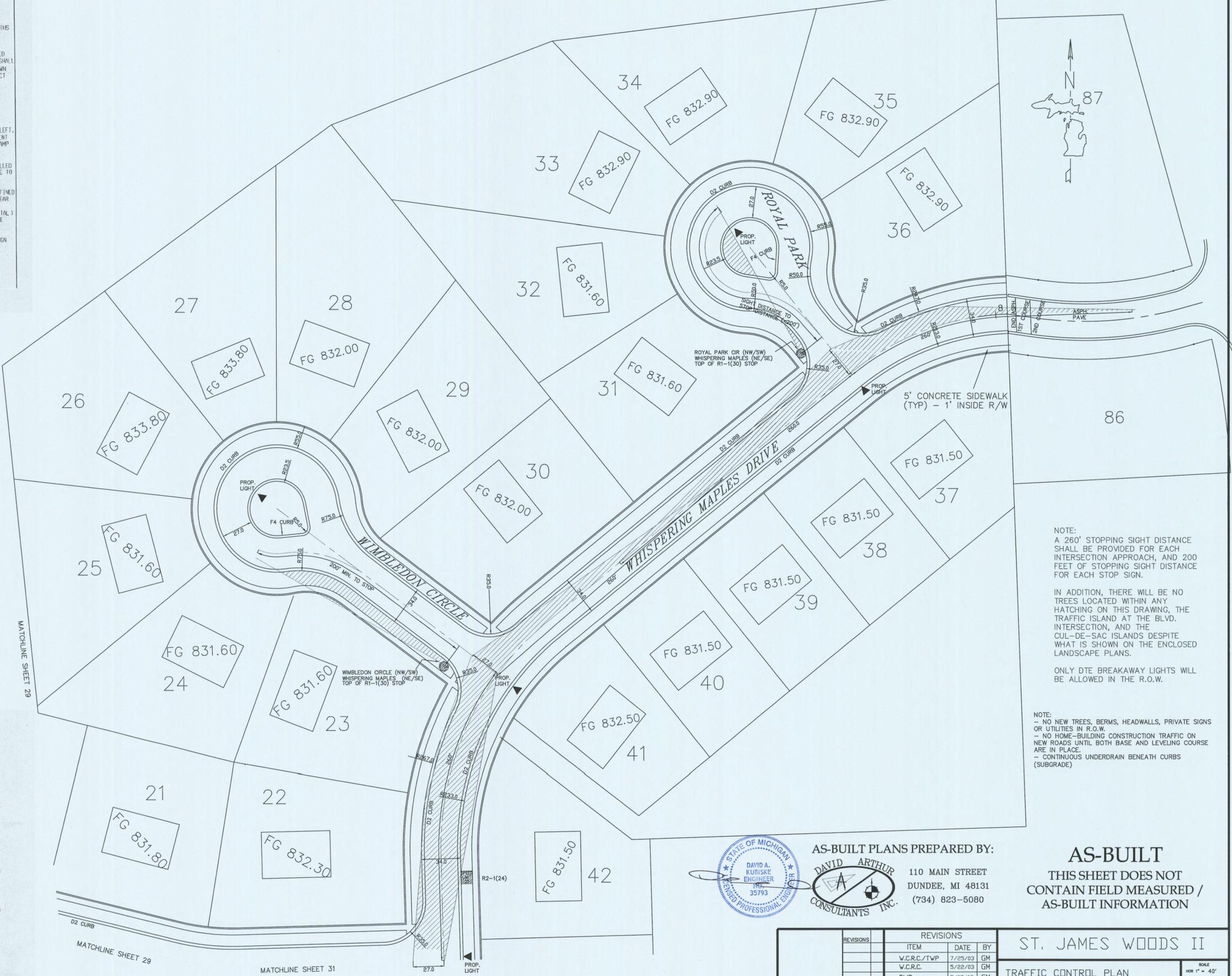
SIGN	SIGN NO.	SIZE	SUPPORT		TOTAL LENGTH (ft)	NO. OF SIGNS
			AREA (sq ft)	TYPE		
STOP	R1-11001	2.5' x 2.5'	8.25	11A	1	14
	R1-11361	3' x 3'	9	11B	2	30
SPEED LIMIT 35	R2-11241	2' x 2.5'	5	11B	1	14
	R2-11361	3' x 4'	12	11B	2	30
M4-11241	M4-11241	2' x 2.5'	5	11B	1	14
	M4-11361	3' x 4'	12	11B	2	30

NOTES:  
 1. TOTAL SUPPORT LENGTHS ARE FOR ESTIMATING PURPOSES ONLY.  
 2. THE SUPPORT(S) LISTED FOR STANDARD SIGNS SHALL BE USED, UNLESS SHOWN OTHERWISE ON CONTRACT SIGN PLAN SHEETS.  
 3. ALLOW A VALUE OF 4.2 in. FOR INSTALLATIONS WITH COMBINATIONS OF TWO PANELS, AS SHOWN AT LEFT. THIS 2 in. REQUIREMENT DOES NOT APPLY TO RAMP SERVICES SIGNS (E11-15 SERIES) WHICH SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO EACH OTHER.  
 4. BOTTOM HEIGHT IS DEFINED AS HEIGHT FROM THE NEAR EDGE OF TRAVEL LANE PAVEMENT (EDGE OF METAL) TO THE BOTTOM OF THE SIGN PANEL. SEE VIII-120E FOR REQUIRED MINIMUM SIGN BOTTOM HEIGHTS.  
 \* 7 ft BOTTOM HEIGHT APPLIES TO PARENT SIGN.

LEGEND:

- STOP SIGN
- KEEP RIGHT
- SPEED LIMIT
- POST W/ STREET NAMES
- 260' CLEAR SIGHT DISTANCE
- STREET LIGHT

- Please add the following to the Construction Traffic Control Notes:
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  - All construction warning signs shall be supplemented with two (2) fluorescent orange warning flags positioned above the sign. Those signs in use during hours of darkness shall also be lighted with two (2) Type A warning flashers. The plastic drums and Type III barricades shall have one (1) and three (3) Type C steady-burning warning lights attached, respectively.
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NOTE:  
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NOTE:  
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 - CONTINUOUS UNDERDRAIN BENEATH CURBS (SUBGRADE)

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS, INC.**  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

STATE OF MICHIGAN  
 DAVID A. KUBISKE  
 ENGINEER  
 NO. 35793  
 LICENSED PROFESSIONAL ENGINEER

**AS-BUILT**  
 THIS SHEET DOES NOT  
 CONTAIN FIELD MEASURED /  
 AS-BUILT INFORMATION

NOTE:  
 LIGHT POLE DETAIL WILL BE PROVIDED BY DETROIT EDISON.

REVISIONS	REVISIONS	DATE	BY
	W.C.R.C./TWP	7/25/03	GM
	W.C.R.C.	5/22/03	GM
	TWP.	5/07/03	GM
	REVISION	11/25/02	KMD
8/4/05	GM REVISION	10/30/02	KMD
7/11/05	GM DISTANCE AND GRADING REVISIONS	10/22/02	KMD
3/18/05	GM REVISION	08/30/02	KMD
8/2/04	GM REVISION	08/13/02	KMD
3/31/04	GM DRAWN BY N.A.	DESIGNED BY DATE	02,07,02

**ST. JAMES WOODS II**  
 TRAFFIC CONTROL PLAN

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734) 481-1322  
 FAX (734) 481-2215

SCALE:  
 HOR 1" = 40'  
 VER 1" = 10'

FIELD BOOK NO.  
 JOB NO.  
 00068  
 SHEET NO.  
 30 OF 42

LOHR ROAD

LEGEND:

STOP SIGN	
KEEP RIGHT	
SPEED LIMIT	
POST W/ STREET NAMES	
260' CLEAR SIGHT DISTANCE	
STREET LIGHT	

NOTE:  
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- CONTINUOUS UNDERDRAIN BENEATH CURBS (SUBGRADE)

SIGN	SIGN NO.	SIZE	SIGN AREA FT <sup>2</sup>	SIGN TYPE	NO.	SUPPORT		
						SIZE	TOTAL LENGTH FT	H. FT.
	R1-1(30)	2.5' x 2.5'	6.25	111A	1	3 lbs	14	7 ft
	R1-1(36)	3' x 3'	9	111A	2	3 lbs	30	7 ft
	R2-1(24)	2' x 2.5'	5	111B	1	3 lbs	14	7 ft
	R2-1(36)	3' x 4'	12	111B	2	3 lbs	32	7 ft
	R4-7(24)	2' x 2.5'	5	111B	1	3 lbs	14	7 ft
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  - THE SUPPORT(S) LISTED FOR STANDARD SIGNS SHALL BE USED, UNLESS SHOWN OTHERWISE ON CONTRACT SIGN PLAN SHEETS.
  - ALLOW A VALUE OF H=2 in. FOR INSTALLATIONS WITH COMBINATIONS OF TWO PANELS, AS SHOWN AT LEFT. THIS 2 in. REQUIREMENT DOES NOT APPLY TO RAMP SERVICES SIGNS (E11-15 SERIES) WHICH SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO EACH OTHER.
  - BOTTOM HEIGHT IS DEFINED AS HEIGHT FROM THE NEAR EDGE OF TRAVEL LANE PAVEMENT (EDGE-OF-METAL) TO THE BOTTOM OF THE SIGN PANEL. SEE VIII-120E FOR REQUIRED MINIMUM SIGN BOTTOM HEIGHTS.
- \*7 ft BOTTOM HEIGHT APPLIES TO PARENT SIGN.

Please add the following to the Construction Traffic Control Notes:

- The Contractor shall provide seven (7) working days notice to the Washtenaw County Road Commission (W.C.R.C.) prior to beginning construction.
- All construction warning signs shall be supplemented with two (2) fluorescent orange warning flags positioned above the sign. Those signs in use during hours of darkness shall also be lighted with two (2) Type A warning flashers. The plastic drums and Type III barricades shall have one (1) and three (3) Type C steady-burning warning lights attached, respectively.
- All traffic control devices including signs, barricades, plastic drums, and warning lights are the responsibility of the Contractor.
- Signs, if required with the Type III barricades, shall be mounted above the barricades on separate supports.
- Traffic control devices are to be maintained by the Contractor for the duration of the project. Night patrols of the construction area and detour route shall be conducted by the Contractor. This will not be paid for separately, but will be considered as having been included in the unit prices bid for temporary traffic control items.
- All traffic control signing shall be in accordance with the latest edition of the "Michigan Manual of Uniform Traffic Control Devices".
- The W20-4, W20-7a, and W20-15 signs shall be covered or taken down when the flagging operation is not being utilized.
- The Contractor shall stake all construction sign locations and notify W.C.R.C. when the staking is complete. The Contractor shall allow two (2) working days for W.C.R.C. to review, adjust, and approve the construction sign staking.
- The construction sign stakes shall indicate the type (code) and size of the sign to be placed at each location. Each stake shall be marked with white flagging ribbon.
- Type III barricades shall consist of twelve (12) foot sections.
- All M4-9 signs shall be supplemented with D3-1 panels.

NOTE:  
A 260' STOPPING SIGHT DISTANCE SHALL BE PROVIDED FOR EACH INTERSECTION APPROACH, AND 200 FEET OF STOPPING SIGHT DISTANCE FOR EACH STOP SIGN.

IN ADDITION, THERE WILL BE NO TREES LOCATED WITHIN ANY HATCHING ON THIS DRAWING, THE TRAFFIC ISLAND AT THE BLVD. INTERSECTION, AND THE CUL-DE-SAC ISLANDS DESPITE WHAT IS SHOWN ON THE ENCLOSED LANDSCAPE PLANS.

ONLY DTE BREAKAWAY LIGHTS WILL BE ALLOWED IN THE R.O.W.

**AS-BUILT**  
THIS SHEET DOES NOT CONTAIN FIELD MEASURED / AS-BUILT INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



REVISIONS		REVISIONS			
NO.	DATE	ITEM	DATE	BY	
		W.C.R.C./TWP	7/25/03	GM	
		W.C.R.C.	5/22/03	GM	
		TWP.	5/07/03	GM	
		REVISION	2/6/03	GM	
8/4/05	GM	REVISION	11/25/02	KMD	
7/11/05	GM	REVISION	10/30/02	KMD	
3/18/05	GM	BRIDGE AND GRADING REVISIONS	10/22/02	KMD	
8/2/04	GM	REVISION	08/30/02	KMD	
3/31/04	GM	DRAWN BY KMD	DESIGNED BY	DATE	08/13/02

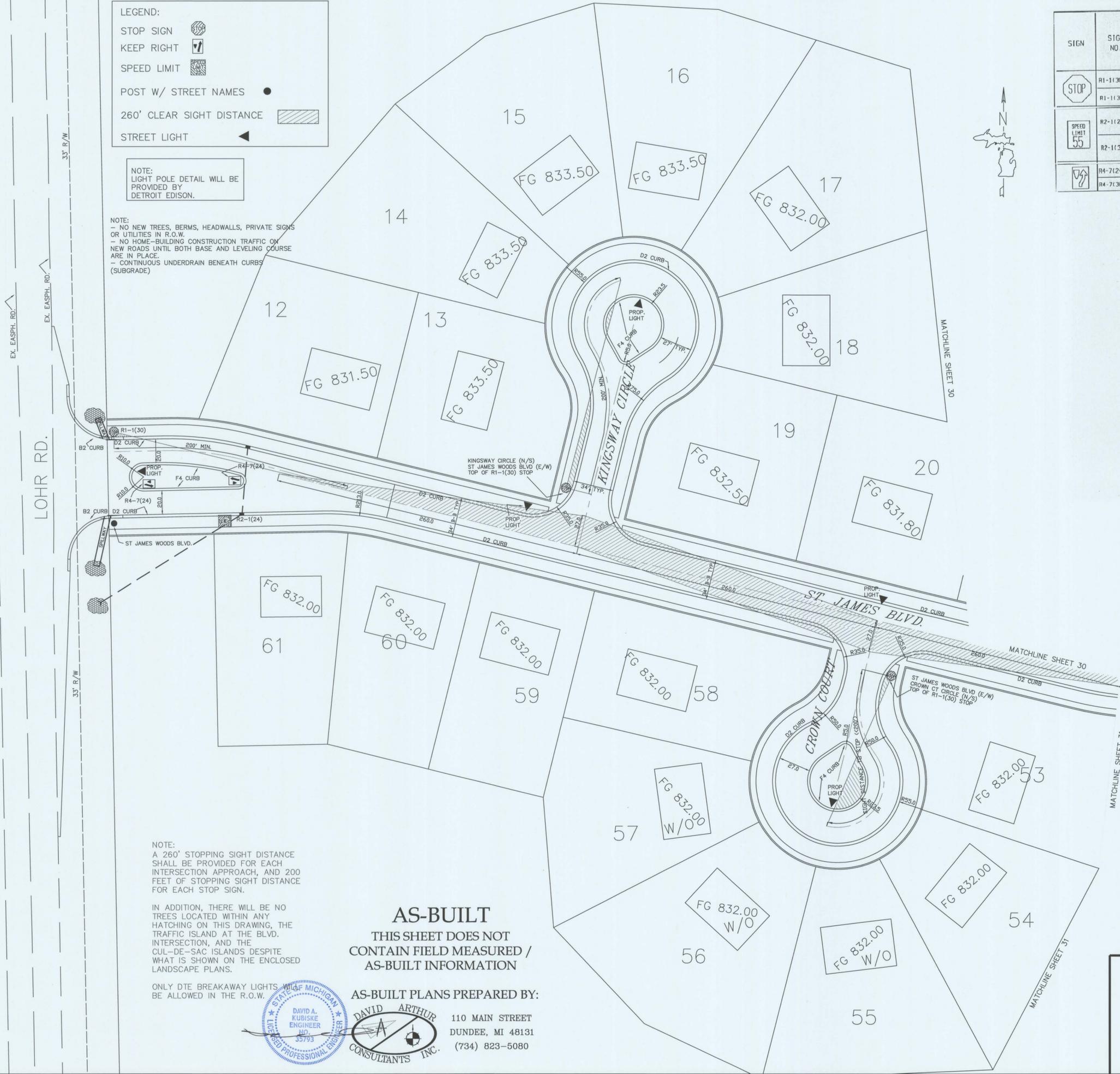
**ST. JAMES WOODS II**

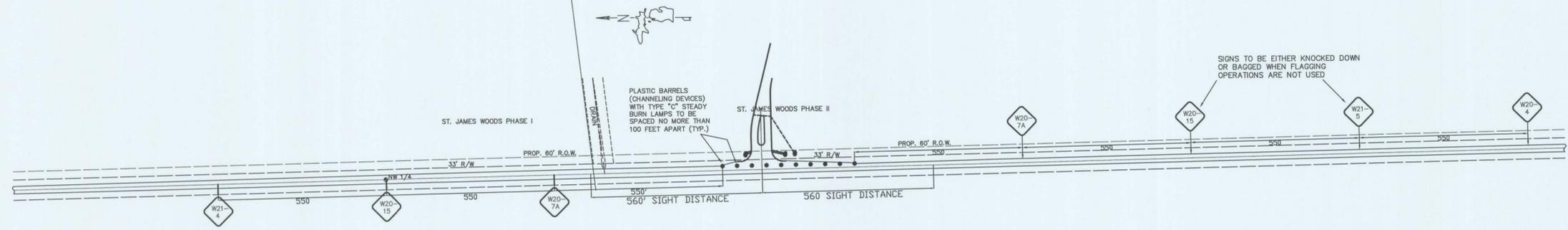
TRAFFIC CONTROL PLAN

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734)481-1322  
FAX (734)481-2215

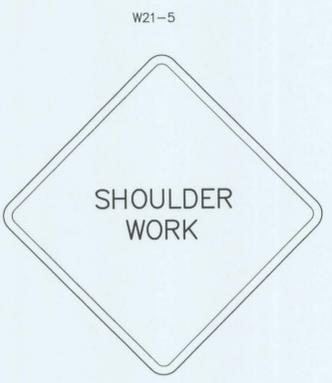
SCALE  
HOR 1" = 40'  
VER 1" = 40'

FIELD BOOK NO.  
JOB NO.  
00068  
SHEET NO.  
29 OF 42





LOHR RD. (PROPOSED 120' WD./55 M.P.H.)



- Please add the following to the Construction Traffic Control Notes:
- The Contractor shall provide seven (7) working days notice to the Washtenaw County Road Commission (W.C.R.C.) prior to beginning construction.
  - All construction warning signs shall be supplemented with two (2) fluorescent orange warning flags positioned above the sign. Those signs in use during hours of darkness shall also be lighted with two (2) Type A warning flashers. The plastic drums and Type III barricades shall have one (1) and three (3) Type C steady-burning warning lights attached, respectively.
  - All traffic control devices including signs, barricades, plastic drums, and warning lights are the responsibility of the Contractor.
  - Signs, if required with the Type III barricades, shall be mounted above the barricades on separate supports.
  - Traffic control devices are to be maintained by the Contractor for the duration of the project. Night patrols of the construction area and detour route shall be conducted by the Contractor. This will not be paid for separately, but will be considered as having been included in the unit prices bid for temporary traffic control items.
  - All traffic control signing shall be in accordance with the latest edition of the "Michigan Manual of Uniform Traffic Control Devices".
  - The W20-4, W20-7a, and W20-15 signs shall be covered or taken down when the flagging operation is not being utilized.
  - The Contractor shall stake all construction sign locations and notify W.C.R.C. when the staking is complete. The Contractor shall allow two (2) working days for W.C.R.C. to review, adjust, and approve the construction sign staking.
  - The construction sign stakes shall indicate the type (code) and size of the sign to be placed at each location. Each stake shall be marked with white flagging ribbon.
  - Type III barricades shall consist of twelve (12) foot sections.
  - All M4-9 signs shall be supplemented with D3-1 panels.



**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

CSPA#96-22  
3 WORKING DAYS  
BEFORE YOU DIG  
CALL MISS DIG  
1-800-482-7171  
FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS		REVISIONS		
DATE	BY	ITEM	DATE	BY
		WCRS/TWP	7/25/03	GM
		WCRS	5/22/03	GM
		TWP	5/07/03	GM
		REVISION	2/6/03	GM
8/4/05	GM	REVISION	11/25/02	KMD
7/11/05	GM	REVISION	10/30/02	KMD
3/18/05	GM	REVISION	10/22/02	KMD
8/2/04	GM	REVISION	08/30/02	KMD
3/31/04	GM	DESIGNED BY	DATE	
		KMD	08/13/02	

**ST. JAMES WOODS II**

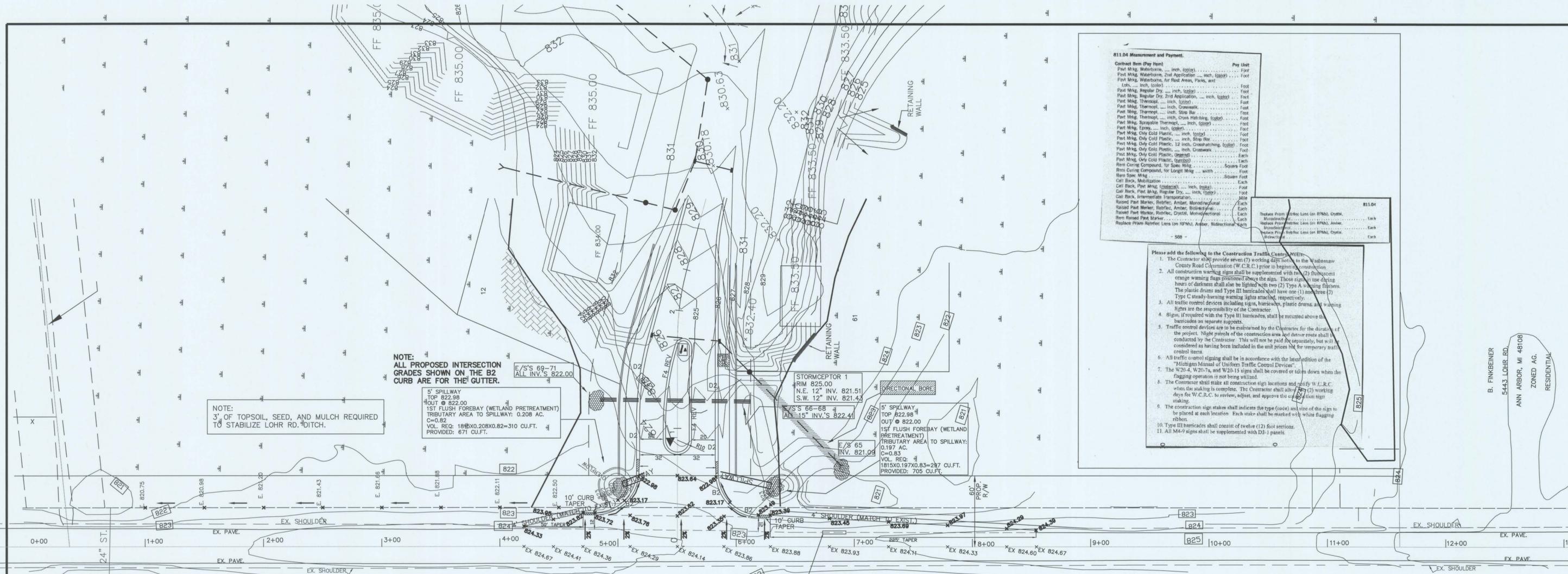
CONSTRUCTION SIGNAGE

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 200'  
VER 1" = 10'

JOB NO.  
00068

SHEET NO.  
28 OF 42



**NOTE:**  
ALL PROPOSED INTERSECTION GRADES SHOWN ON THE B2 CURB ARE FOR THE GUTTER.

**NOTE:**  
3' OF TOPSOIL, SEED, AND MULCH REQUIRED TO STABILIZE LOHR RD. DITCH.

5' SPILLWAY  
TOP @ 822.98  
OUT @ 822.00  
1ST FLUSH FOREBAY (WETLAND PRETREATMENT) TRIBUTARY AREA TO SPILLWAY: 0.208 AC.  
C=0.82  
VOL. REQ: 1815X0.208X0.82=310 CU.FT.  
PROVIDED: 671 CU.FT.

STORMCEPTOR 1  
RIM 825.00  
N.E. 12" INV. 821.51  
S.W. 12" INV. 821.41

5' SPILLWAY  
TOP @ 822.98  
OUT @ 822.00  
1ST FLUSH FOREBAY (WETLAND PRETREATMENT) TRIBUTARY AREA TO SPILLWAY: 0.197 AC.  
C=0.83  
VOL. REQ: 1815X0.197X0.83=287 CU.FT.  
PROVIDED: 705 CU.FT.

**NOTE:**  
SAWTOOTH EDGE OF EXISTING PAVEMENT 1 FOOT.  
FIELD MEASUREMENTS BASED ON U.S.G.S. (NAD 1983) DATUM.  
ELEVATIONS ARE BASED ON BUTT JOINT.

**LEGEND**

EX. GRADE	x 822.58
PROP. T/C	I/C 824.37
PROP. GUTTER	g 823.87
PROP. PAVE. GRADE	x 822.58
STREET LIGHT	▼
SLOPE STAKE LINE	- - -
EXIST. CONTOUR	823

- 3' OF TOPSOIL, SEED, AND MULCH REQUIRED TO STABILIZE LOHR RD. DITCH.
- ALL ROAD SIGNS SHALL BE ERECTED AND MAINTAINED IN ACCORDANCE WITH THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES.

**B11.04 Measurement and Payment.**

Contract Item (Pay Item)	Pay Unit
Foot Mfg. Waterborne, 1st Application	Four
Foot Mfg. Waterborne, 2nd Application	Four
Foot Mfg. Waterborne, for Road Area, Parks, and	Four
Foot Mfg. Regular Dry, 1st Application	Four
Foot Mfg. Regular Dry, 2nd Application	Four
Foot Mfg. Thermoplastic, 1st Application	Four
Foot Mfg. Thermoplastic, 2nd Application	Four
Foot Mfg. Thermoplastic, 3rd Application	Four
Foot Mfg. Thermoplastic, 4th Application	Four
Foot Mfg. Thermoplastic, 5th Application	Four
Foot Mfg. Thermoplastic, 6th Application	Four
Foot Mfg. Thermoplastic, 7th Application	Four
Foot Mfg. Thermoplastic, 8th Application	Four
Foot Mfg. Thermoplastic, 9th Application	Four
Foot Mfg. Thermoplastic, 10th Application	Four
Foot Mfg. Thermoplastic, 11th Application	Four
Foot Mfg. Thermoplastic, 12th Application	Four
Foot Mfg. Thermoplastic, 13th Application	Four
Foot Mfg. Thermoplastic, 14th Application	Four
Foot Mfg. Thermoplastic, 15th Application	Four
Foot Mfg. Thermoplastic, 16th Application	Four
Foot Mfg. Thermoplastic, 17th Application	Four
Foot Mfg. Thermoplastic, 18th Application	Four
Foot Mfg. Thermoplastic, 19th Application	Four
Foot Mfg. Thermoplastic, 20th Application	Four
Foot Mfg. Thermoplastic, 21st Application	Four
Foot Mfg. Thermoplastic, 22nd Application	Four
Foot Mfg. Thermoplastic, 23rd Application	Four
Foot Mfg. Thermoplastic, 24th Application	Four
Foot Mfg. Thermoplastic, 25th Application	Four
Foot Mfg. Thermoplastic, 26th Application	Four
Foot Mfg. Thermoplastic, 27th Application	Four
Foot Mfg. Thermoplastic, 28th Application	Four
Foot Mfg. Thermoplastic, 29th Application	Four
Foot Mfg. Thermoplastic, 30th Application	Four
Foot Mfg. Thermoplastic, 31st Application	Four
Foot Mfg. Thermoplastic, 32nd Application	Four
Foot Mfg. Thermoplastic, 33rd Application	Four
Foot Mfg. Thermoplastic, 34th Application	Four
Foot Mfg. Thermoplastic, 35th Application	Four
Foot Mfg. Thermoplastic, 36th Application	Four
Foot Mfg. Thermoplastic, 37th Application	Four
Foot Mfg. Thermoplastic, 38th Application	Four
Foot Mfg. Thermoplastic, 39th Application	Four
Foot Mfg. Thermoplastic, 40th Application	Four
Foot Mfg. Thermoplastic, 41st Application	Four
Foot Mfg. Thermoplastic, 42nd Application	Four
Foot Mfg. Thermoplastic, 43rd Application	Four
Foot Mfg. Thermoplastic, 44th Application	Four
Foot Mfg. Thermoplastic, 45th Application	Four
Foot Mfg. Thermoplastic, 46th Application	Four
Foot Mfg. Thermoplastic, 47th Application	Four
Foot Mfg. Thermoplastic, 48th Application	Four
Foot Mfg. Thermoplastic, 49th Application	Four
Foot Mfg. Thermoplastic, 50th Application	Four
Foot Mfg. Thermoplastic, 51st Application	Four
Foot Mfg. Thermoplastic, 52nd Application	Four
Foot Mfg. Thermoplastic, 53rd Application	Four
Foot Mfg. Thermoplastic, 54th Application	Four
Foot Mfg. Thermoplastic, 55th Application	Four
Foot Mfg. Thermoplastic, 56th Application	Four
Foot Mfg. Thermoplastic, 57th Application	Four
Foot Mfg. Thermoplastic, 58th Application	Four
Foot Mfg. Thermoplastic, 59th Application	Four
Foot Mfg. Thermoplastic, 60th Application	Four
Foot Mfg. Thermoplastic, 61st Application	Four
Foot Mfg. Thermoplastic, 62nd Application	Four
Foot Mfg. Thermoplastic, 63rd Application	Four
Foot Mfg. Thermoplastic, 64th Application	Four
Foot Mfg. Thermoplastic, 65th Application	Four
Foot Mfg. Thermoplastic, 66th Application	Four
Foot Mfg. Thermoplastic, 67th Application	Four
Foot Mfg. Thermoplastic, 68th Application	Four
Foot Mfg. Thermoplastic, 69th Application	Four
Foot Mfg. Thermoplastic, 70th Application	Four
Foot Mfg. Thermoplastic, 71st Application	Four
Foot Mfg. Thermoplastic, 72nd Application	Four
Foot Mfg. Thermoplastic, 73rd Application	Four
Foot Mfg. Thermoplastic, 74th Application	Four
Foot Mfg. Thermoplastic, 75th Application	Four
Foot Mfg. Thermoplastic, 76th Application	Four
Foot Mfg. Thermoplastic, 77th Application	Four
Foot Mfg. Thermoplastic, 78th Application	Four
Foot Mfg. Thermoplastic, 79th Application	Four
Foot Mfg. Thermoplastic, 80th Application	Four
Foot Mfg. Thermoplastic, 81st Application	Four
Foot Mfg. Thermoplastic, 82nd Application	Four
Foot Mfg. Thermoplastic, 83rd Application	Four
Foot Mfg. Thermoplastic, 84th Application	Four
Foot Mfg. Thermoplastic, 85th Application	Four
Foot Mfg. Thermoplastic, 86th Application	Four
Foot Mfg. Thermoplastic, 87th Application	Four
Foot Mfg. Thermoplastic, 88th Application	Four
Foot Mfg. Thermoplastic, 89th Application	Four
Foot Mfg. Thermoplastic, 90th Application	Four
Foot Mfg. Thermoplastic, 91st Application	Four
Foot Mfg. Thermoplastic, 92nd Application	Four
Foot Mfg. Thermoplastic, 93rd Application	Four
Foot Mfg. Thermoplastic, 94th Application	Four
Foot Mfg. Thermoplastic, 95th Application	Four
Foot Mfg. Thermoplastic, 96th Application	Four
Foot Mfg. Thermoplastic, 97th Application	Four
Foot Mfg. Thermoplastic, 98th Application	Four
Foot Mfg. Thermoplastic, 99th Application	Four
Foot Mfg. Thermoplastic, 100th Application	Four

- Please add the following to the Construction Traffic Control Plan:
- The Contractor shall provide seven (7) working days notice to the Washtenaw County Road Commission (W.C.R.C.) prior to beginning construction.
  - All construction warning signs shall be supplemented with (2) subsequent orange warning signs positioned above the sign. Those signs in use during hours of darkness shall also be lighted with two (2) Type A warning flashers. The plastic drums and Type III barricades shall have one (1) and three (3) Type C steady-burning warning lights attached, respectively.
  - All traffic control devices including signs, barricades, plastic drums, and warning lights are the responsibility of the Contractor.
  - Signs, if required with the Type III barricades, shall be mounted above the barricades on separate supports.
  - Traffic control devices are to be maintained by the Contractor for the duration of the project. Night patrols of the construction area April through June shall be conducted by the Contractor. This will not be paid for separately, but will be considered as having been included in the unit prices for temporary traffic control items.
  - All traffic control signage shall be in accordance with the latest edition of the "Michigan Manual of Uniform Traffic Control Devices".
  - The W.C.R.C. W-20's, and W-20-15 signs shall be covered or taken down when the flagging operation is not being conducted.
  - The Contractor shall stake all construction sign locations and notify W.C.R.C. when the staking is complete. The Contractor shall allow (7) working days for W.C.R.C. to review, adjust, and approve the final sign staking.
  - The construction sign stakes shall indicate the type (code) and size of the sign to be placed at each location. Each stake shall be marked with white flagging ribbon.
  - Type III barricades shall consist of twelve (12) foot sections.
  - All M-9 signs shall be supplemented with D3-1 panels.

**Table 811-2 Minimum Material Placement Temperature**

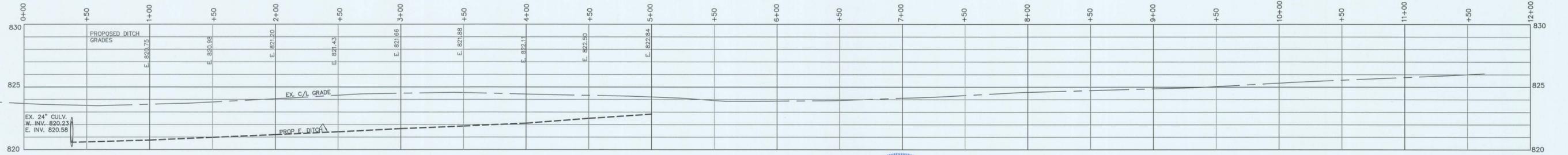
Material	Minimum Air Temperature, °F	Minimum Placement Temperature (a)
Waterborne	50	50
Thermoplastic	48	50
Sprayable Thermoplastic	50	50
Epoxy	50	35
Cold Plastic Tapes	50	70
Regular Dry	70	75
Beads	50	50

a. See test for more detailed information.  
b. If a minimum air temperature is not given the minimum placement temperature will control.

**Table 811-1 Pavement Marking Material Application Rates per Mile**

Line Type	Waterborne		Thermoplastic		Sprayable Thermoplastic		Epoxy		Regular Dry	
	Binder (gal)	Beads (lb)	Binder (lb)	Beads (lb)	Binder (lb)	Beads (lb)	Binder (gal)	Beads (lb)	Binder (gal)	Beads (lb)
Broken										
4 inch	4	32	455	44	180	126	5.5	137	4	24
8 inch	8	64	910	88	360	250	11	275	8	48
Solid										
4 inch	16	128	1820	176	720	22	560	16	96	
8 inch	32	256	3640	352	1440	44	1100	32	192	

The Engineer will determine application rates by dividing the quantity of material used by the length of line painted. At start up, and occa-



**AS-BUILT**  
THIS SHEET DOES NOT CONTAIN FIELD MEASURED / AS-BUILT INFORMATION

DESIGNED BY: **DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



REVISIONS			BY	DATE	ITEM
TWP/WCDC	2/20/07	GM			
TWP	8/4/05	GM			
TWP	7/11/05	GM			
WCDC	4/26/05	GM			
DEQ/TWP/WCDC	3/18/05	GM			
WCRC/TWP/WCDC	1/17/05	GM			
WCRC/TWP/WCDC	8/2/04	GM			
DESIGNED BY	DAVID ARTHUR				
DATE	3/31/04				

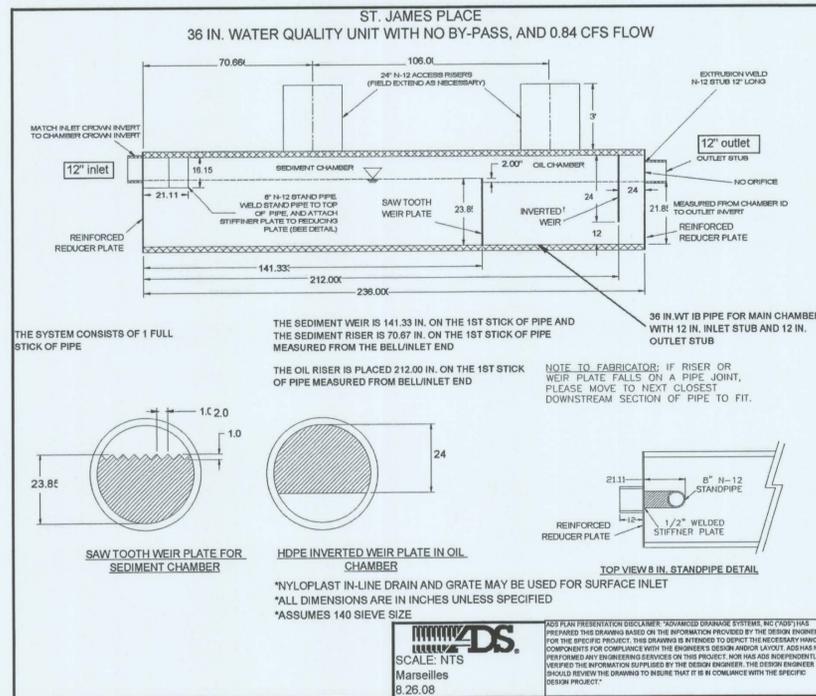
**ST JAMES WOODS II**

**INTERSECTION DETAIL**

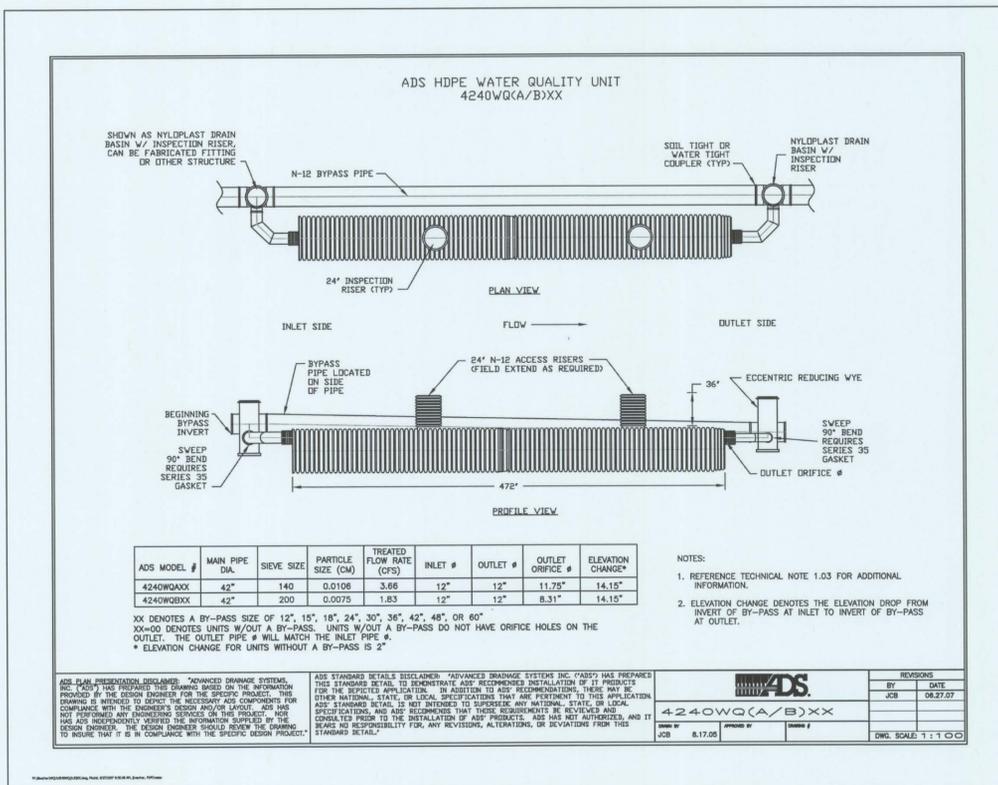
**E.P. KUBISKE & ASSOCIATES, INC.**  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734)481-1322  
FAX (734)481-2215

SCALE: HOR 1" = 40'  
VER 1" = 10'

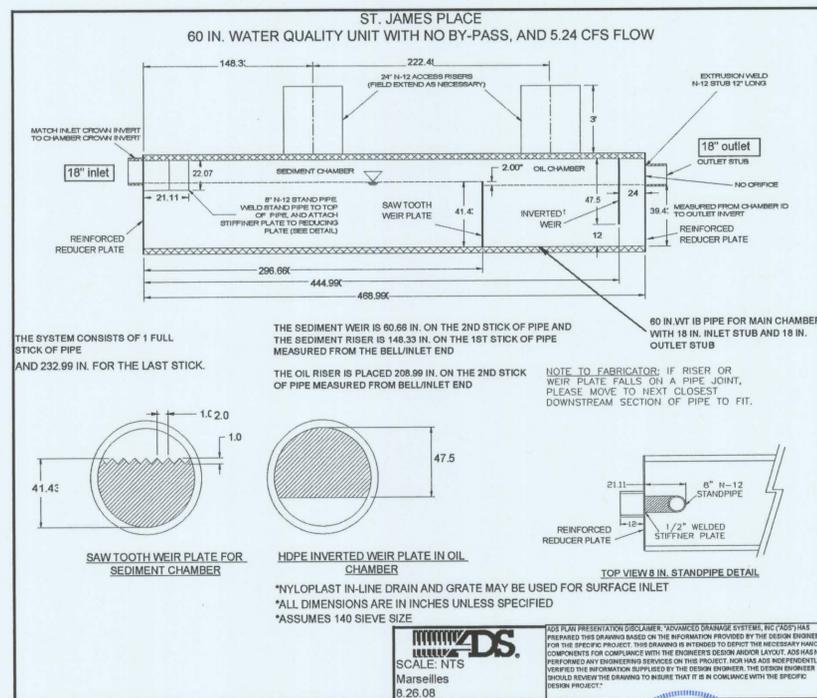
FIELD BOOK NO. 00068  
JOB NO. 00068  
SHEET NO. 27 OF 42



1 STORMCEPTOR 1  
CUSTOM 3680WQ400 N.T.S.



2 STORMCEPTOR 2  
4240WQ400 N.T.S.



3 STORMCEPTOR 3  
CUSTOM 6040WQ400 N.T.S.



**AS-BUILT**  
THIS SHEET DOES NOT  
CONTAIN FIELD MEASURED /  
AS-BUILT INFORMATION

AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR**  
CONSULTANTS INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

Required Minimum Cover\* to Prevent Flotation

	Nominal Diameter in. (mm)	Minimum Cover in. (mm)
Dual Wall HDPE	4 (100)	3 (77)
	6 (150)	4 (102)
	8 (200)	5 (127)
	10 (250)	7 (178)
	12 (300)	9 (368)
	15 (375)	11 (457)
	18 (450)	13 (559)
	24 (600)	17 (711)
	30 (750)	22 (914)
	36 (900)	25 (1067)
Single Wall HDPE	42 (1050)	29 (1219)
	48 (1200)	33 (1372)
	60 (1500)	40 (1702)
	3 (75)	2 (50)
	4 (100)	3 (77)
	6 (150)	4 (102)
	8 (200)	6 (152)
	10 (250)	7 (178)
	12 (300)	9 (368)
	15 (375)	11 (457)
18 (450)	13 (559)	
24 (600)	17 (711)	

\*Based on the pipe being completely empty, water table at the ground surface, soil density of 130 pcf (2083 kg/m<sup>3</sup>), and a soil friction angle appropriate for most sand/gravel mixtures. The average of the inside and outside diameters was used to determine soil and water displacement.

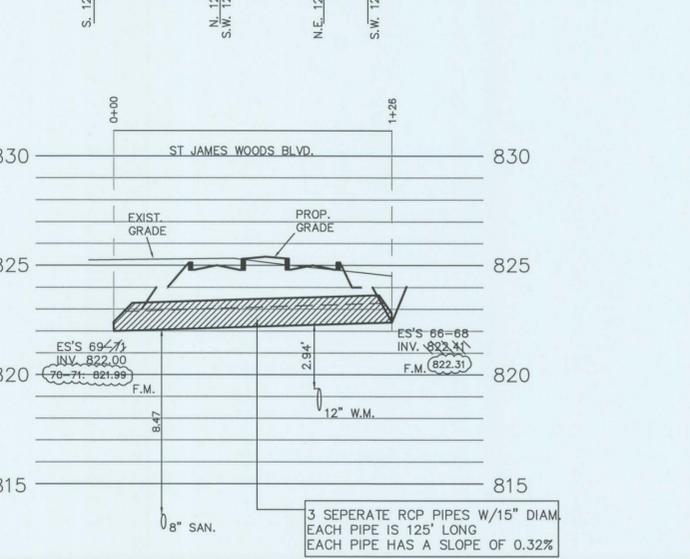
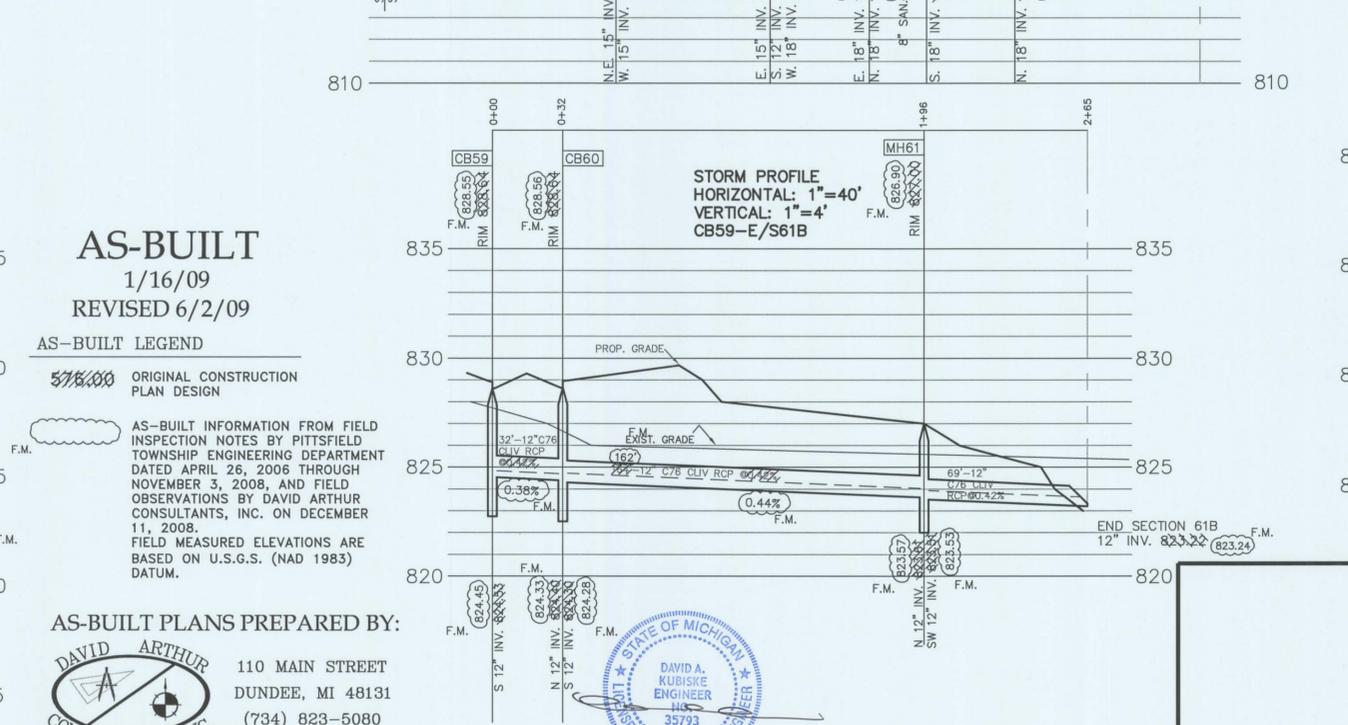
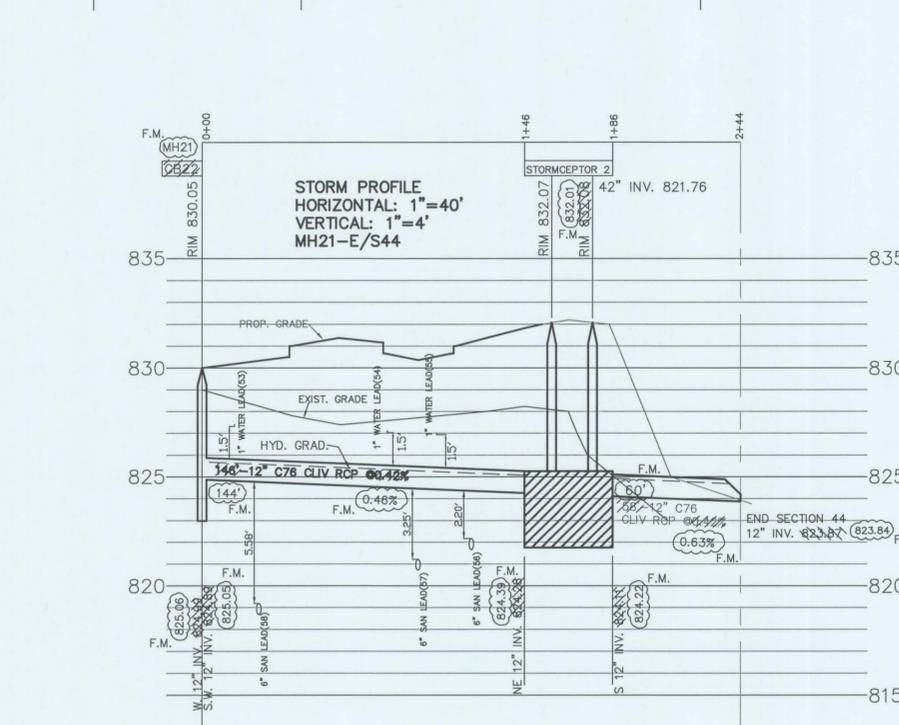
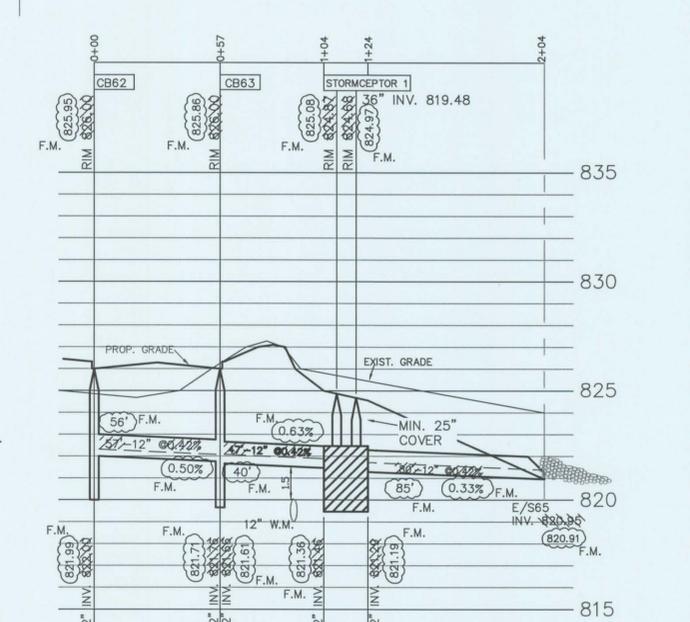
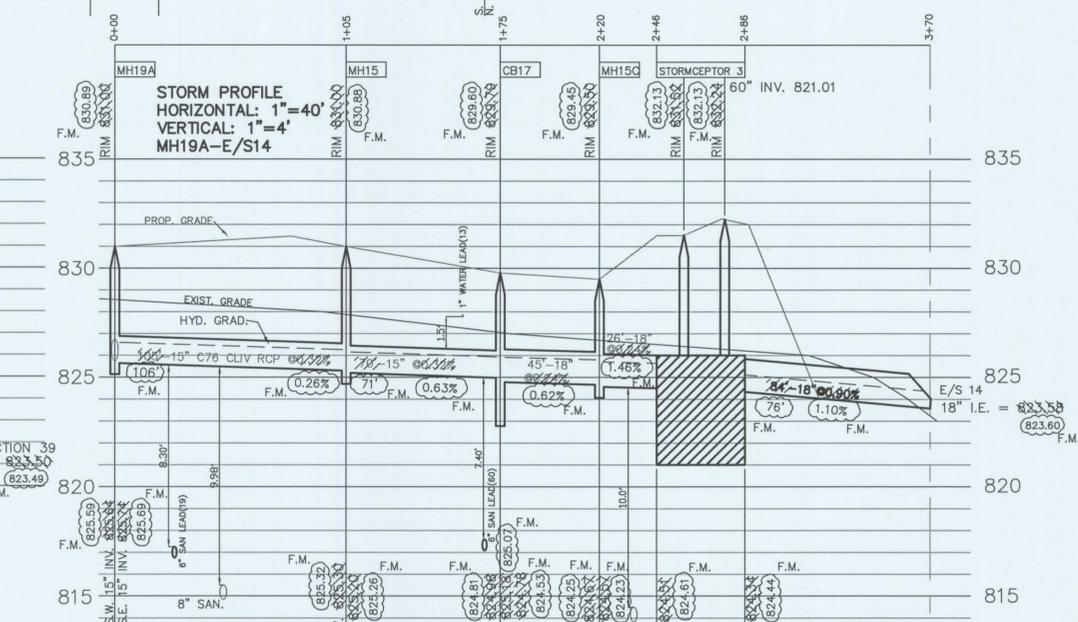
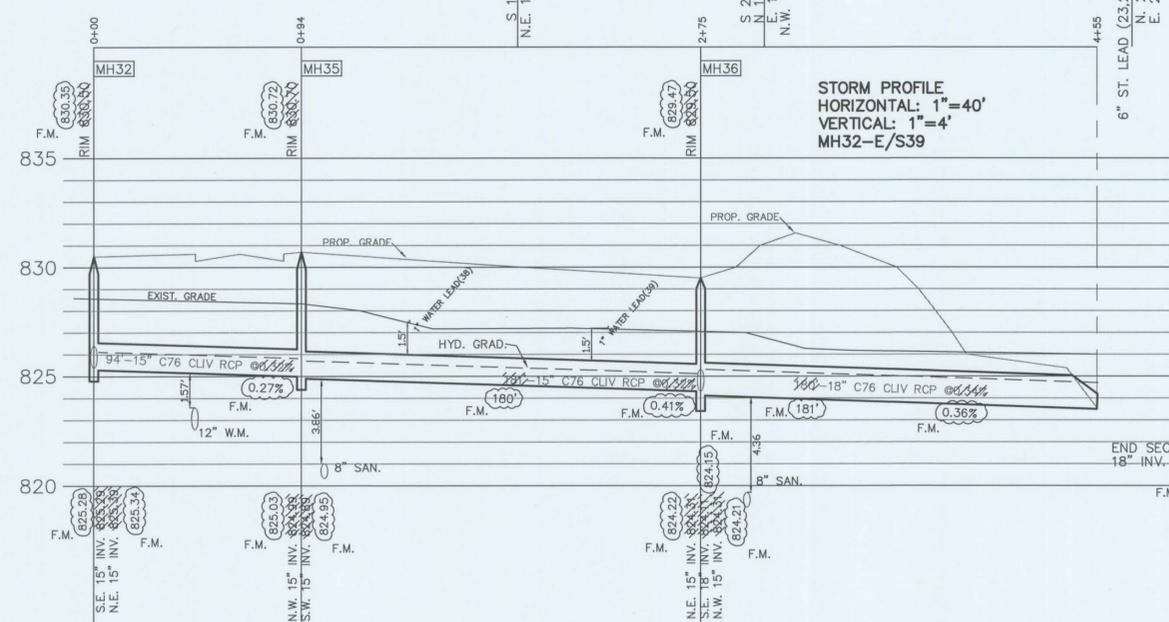
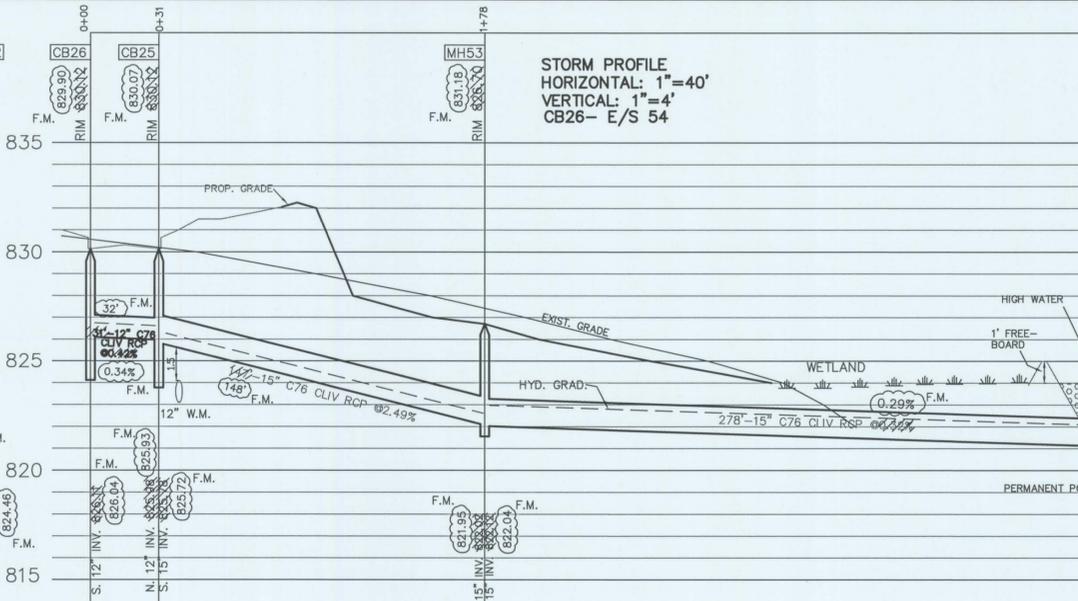
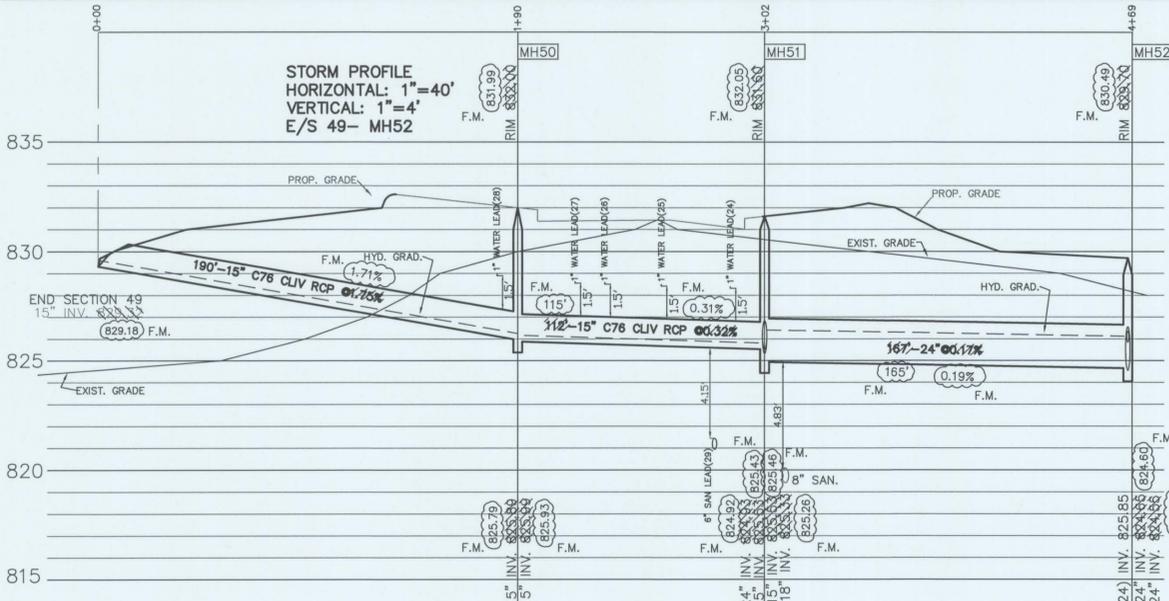
REVISIONS			ST. JAMES WOODS II	
ITEM	DATE	BY		
REVISION	8/7/08	MDK		
PER ADS	8/28/08	LJB		
PER WDCD	9/05/08	LJB		

**STORMCEPTOR DETAILS**

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734)481-1322  
FAX (734)481-2215

SCALE: HOR 1" = N.T.S. VER 1" = N.T.S.  
FIELD BOOK NO.  
JOB NO. 00068  
SHEET NO. 26A OF 42

DRAWN BY: KMD  
DESIGNED BY:  
DATE: 08/13/02



**AS-BUILT**  
1/16/09  
REVISED 6/2/09

**AS-BUILT LEGEND**

ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008.

FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:

**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
TWP	7/11/05	GM
DEQ/TWP/WCDD	3/18/05	GM
WCRC/TWP/WCDD	1/17/05	GM
WCRC/TWP/WCDD	8/2/04	GM
WCRC/TWP	3/31/04	GM
WCRC/TWP	7/25/03	GM
WCRC	5/22/03	GM
WCRC	9/5/02	GM
WCRC	8/28/02	LUB
WCRC	2/20/07	GM

<b>ST. JAMES WOODS II</b>	
<b>STORM PROFILES</b>	
E.P. KUBISKE & ASSOCIATES, INC.	
1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734) 481-1322 FAX (734) 481-2215	

SCALE HOR 1" = 40' VER 1" = 4'
FIELD BOOK NO.
JOB NO. 0006B
SHEET NO.
26 OF 42

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
MH19A-CB18

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
CB17-MH16

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
MH51-CB41

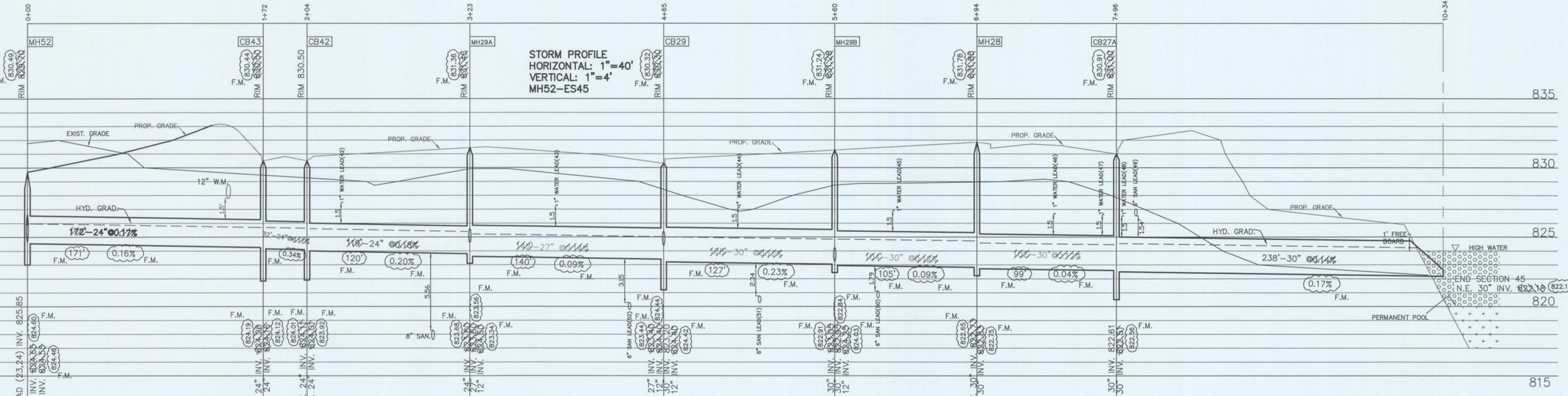
STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
CB30-CB29

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
MH29A-ES29A

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
CB29-ES29B

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
MH29B-ES29C

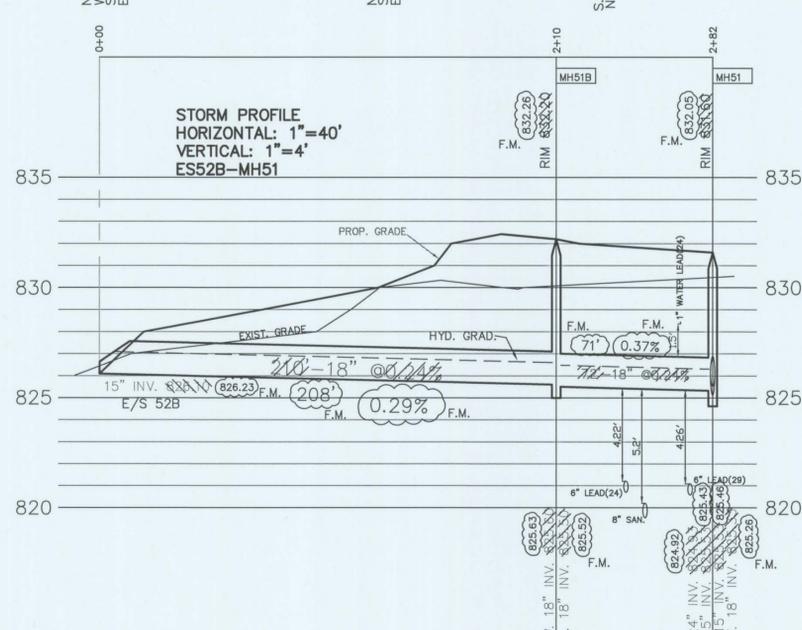
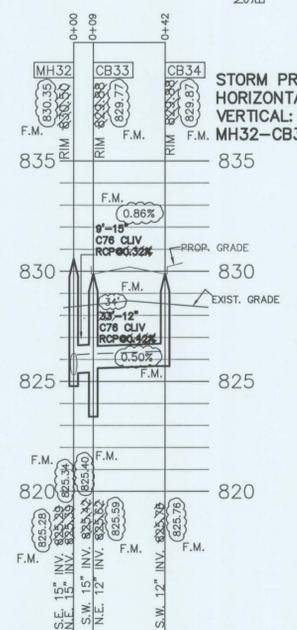
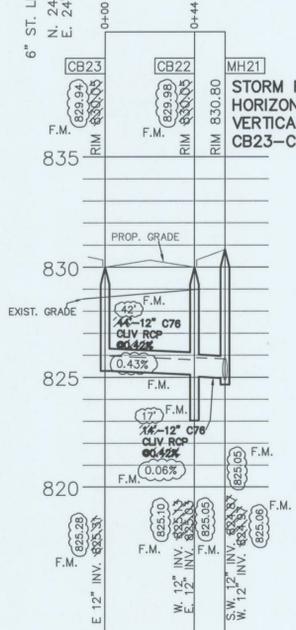
STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
E/S38B-MH36



STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
CB23-CB22

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
MH32-CB34

STORM PROFILE  
HORIZONTAL: 1"=40'  
VERTICAL: 1"=4'  
ES52B-MH51



**AS-BUILT**  
1/16/09  
REVISED 6/2/09

AS-BUILT LEGEND

- ORIGINAL CONSTRUCTION PLAN DESIGN
- AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
TWP	7/11/05	GM
DEQ/TWP/WDCD	3/18/05	GM
WRCR/TWP	1/17/05	GM
WRCR/TWP	8/2/04	GM
WRCR/TWP	3/31/04	GM
WRCR/TWP	7/25/03	GM
WRCR	5/22/03	GM
DESIGNED BY	DATE	
GM	5/07/03	

ST. JAMES WOODS II

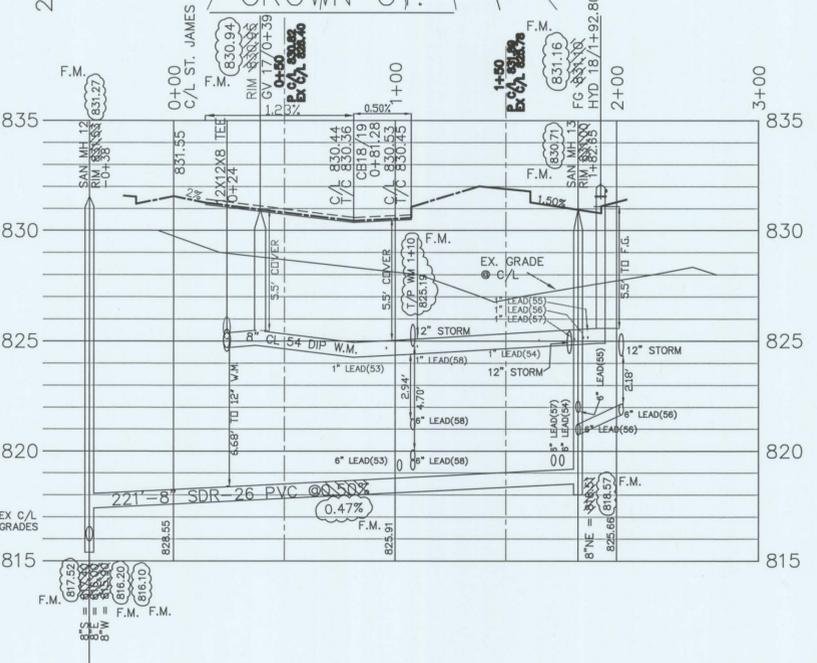
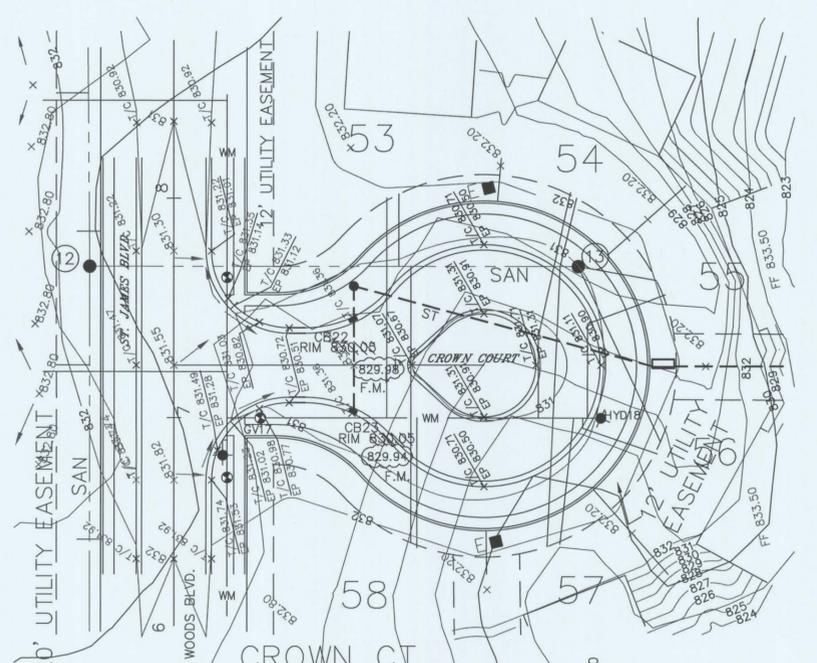
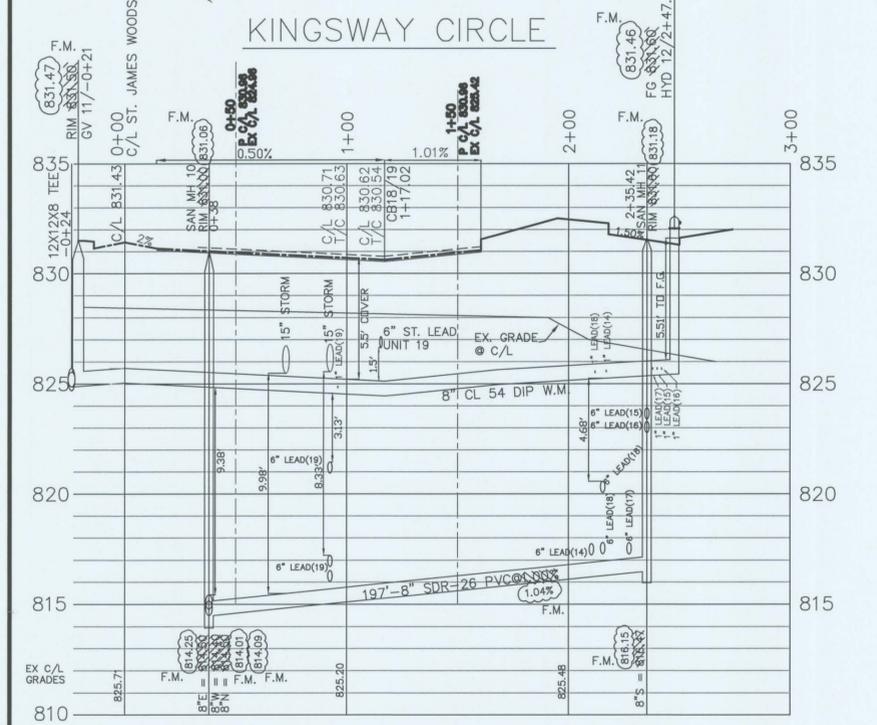
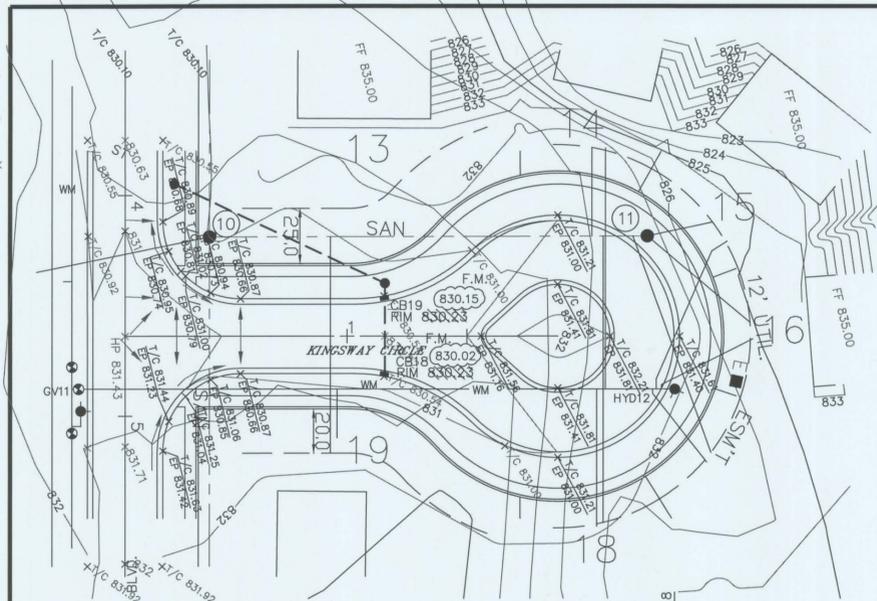
STORM PROFILES

E.P. KUBISKE & ASSOCIATES, INC.



1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 40'  
VER 1" = 4'  
FIELD BOOK NO.  
JOB NO.  
00068  
SHEET NO.  
25 OF 42



NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

**BENCHMARK DATA (U.S.G.S.)**

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90° NORTH AND 55° WEST OF NW CORNER, SECTION 20.  
ELEVATION ..... 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35° NORTH AND 35° EAST OF NW PROPERTY CORNER (PARCEL 12-20-200-004).  
ELEVATION ..... 826.67



**U.S. PIPE** Assembly of 4"-24" TYTON JOINT® Pipe continued

Figure 9. Jack Method of Disassembly

Joints 10" thru 24" may be disassembled by placing jack on plain end as indicated with lug on back end of rack bearing on face of bell. Motion of jack handle causes lug on rack to push against face of bell and move plain end out of socket.



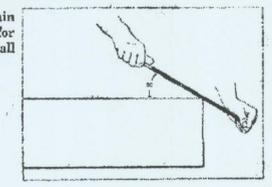
Assembly with Field Cut Pipe

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4-inch at an angle of about 30 degrees with the center line of the pipe

(Fig. 10). This can be done quite easily with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.

Figure 10. Conditioning Field Cut Plain End

The outside edge of field cut plain end pipe may be conditioned for use by filing or grinding a small bevel at an angle of about 30°.



Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches		Approximate Radins in Feet of Curve Produced by Succession of Joints	
		18 ft. Length	19 ft. Length	18 ft. Length	19 ft. Length
4	5°	19	19	205	205
6	5°	19	19	205	205
8	5°	19	19	205	205
10	5°	19	19	205	205
12	5°	19	19	205	205
14	4°	15	15	260	260
16	4°	15	15	260	260
18	3°	11	11	345	345
20	3°	11	11	345	345
24	3°	11	11	345	345
30	3°	11	11	345	345
36	3°	11	11	345	345
42	3°	12*	12*	382*	382*
48	3°	12*	12*	382*	382*

\*20-foot length

1-6 TP 4

LEGEND  
 R.O.W. -----  
 PROP. CENTERLINE -----  
 EXIST. CENTERLINE -----  
 TOP OF CURB -----



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

**AS-BUILT**  
 1/16/09  
 REVISED 6/2/09

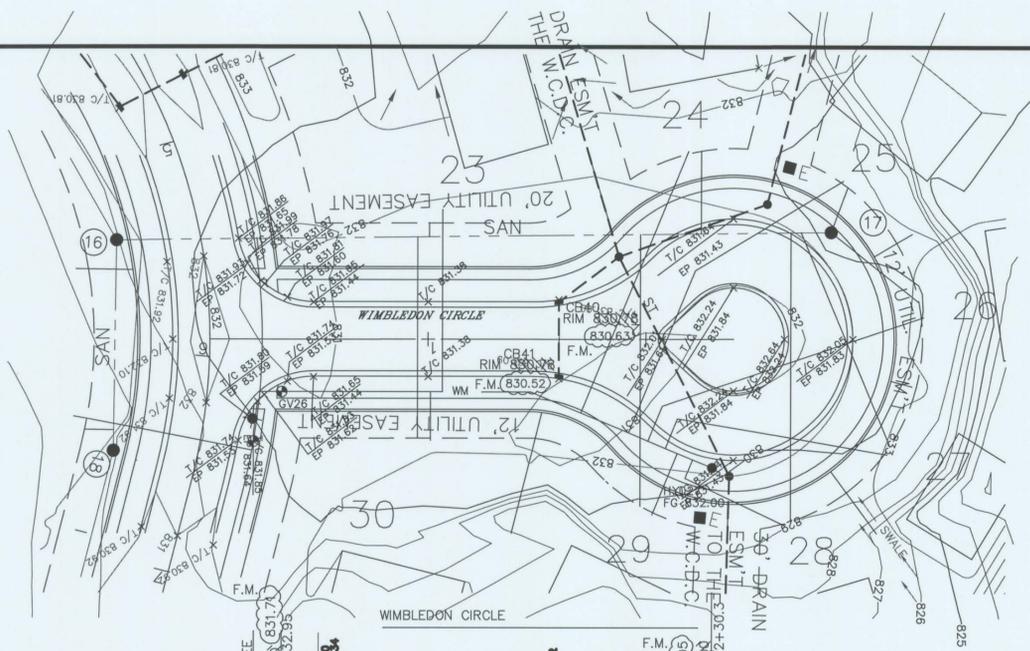
AS-BUILT LEGEND  
 5/16/00 ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

REVISIONS			ST. JAMES WOODS II	
ITEM	DATE	BY		
TWP	8/4/05	GM		
TWP	7/11/05	GM		
DEQ/TWP/WCDC	3/18/05	GM		
WCRC/TWP/WCDC	1/17/05	GM		
WCRC/TWP/WCDC	8/2/04	GM		
WCRC/TWP	3/31/04	GM		
WCRC/TWP	7/25/03	GM		
WCRC	5/22/03	GM		
DRAWN BY	DESIGNED BY	DATE		
GM	GM	5/07/03		

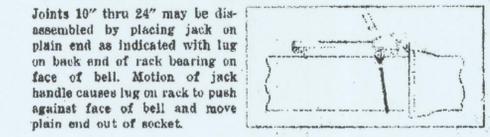
  

KINGSWAY CIR/CROWN CT. STORM, WATER, & SANITARY PLAN & PROFILE		SCALE HOR 1" = 40' VER 1" = 4'
E.P. KUBISKE & ASSOCIATES, INC. 1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734) 481-1322 FAX (734) 481-2215		FIELD BOOK NO. JOB NO. 00068 SHEET NO.



**U.S. PIPE** Assembly of 4"-24" TYTON JOINT® Pipe continued

Figure 9. Jack Method of Disassembly

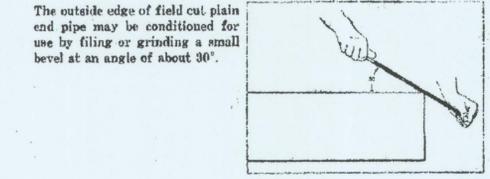


Assembly with Field Cut Pipe

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4-inch at an angle of about 30 degrees with the center line of the pipe

(Fig. 10). This can be done quite easily with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.

Figure 10. Conditioning Field Cut Plain End



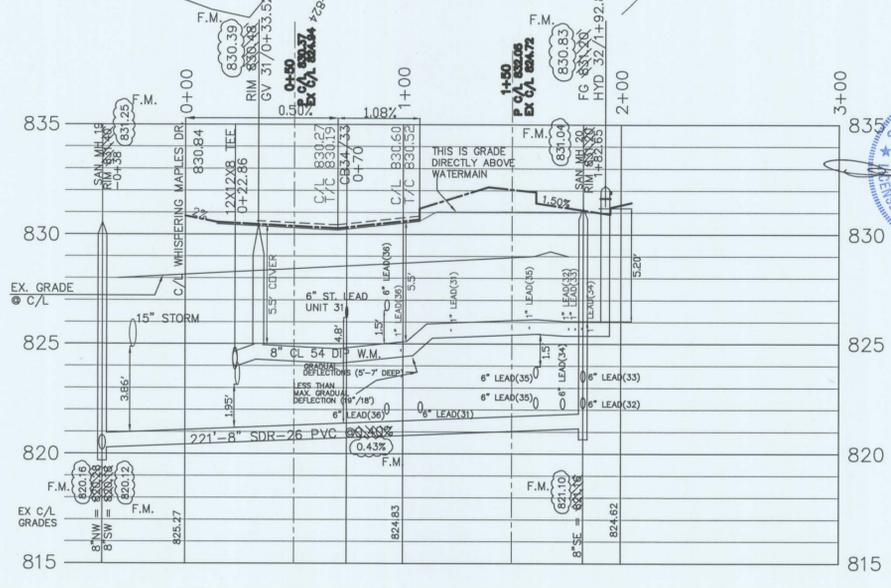
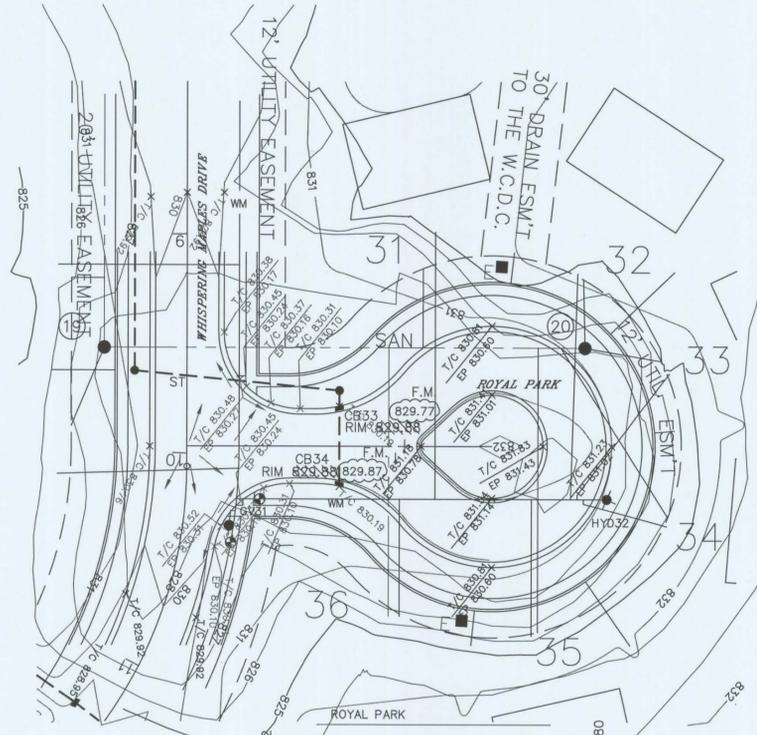
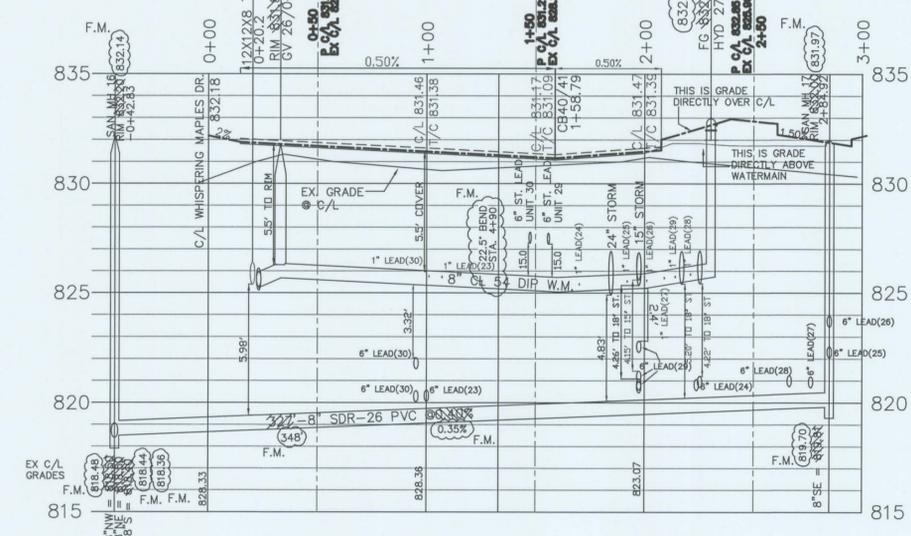
Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches		Approximate Radius in Feet of Curve Produced by Succession of Joints	
		18 ft. Length	18 ft. Length	18 ft. Length	18 ft. Length
4	5°	19		205	
6	5°	19		205	
8	5°	19		205	
10	5°	19		205	
12	5°	19		205	
14	4°	15		260	
16	4°	15		260	
18	3°	11		345	
20	3°	11		345	
24	3°	11		345	
30	3°	11		345	
36	3°	11		345	
42	3°	12*		382*	
48	3°	12*		382*	

\*20-foot length

1-6

TP 4



NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

**BENCHMARK DATA (U.S.G.S.)**

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90° NORTH AND 55'± WEST OF NW CORNER, SECTION 20. ELEVATION 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35° NORTH AND 35'± EAST OF NW PROPERTY CORNER (PARCEL 12-20-200-004). ELEVATION 826.67

LEGEND  
 R.O.W. -----  
 PROP. CENTERLINE -----  
 EXIST. CENTERLINE -----  
 TOP OF CURB -----



DAVID ARTHUR CONSULTANTS INC.  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

**AS-BUILT**  
 1/16/09  
 REVISED 6/2/09

AS-BUILT LEGEND

5/16/09 ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

REVISIONS	ITEM	DATE	BY
	TWP/WCOC	2/20/07	GM
	TWP	8/4/05	GM
	TWP	7/11/05	GM
	DEQ/TWP/WCOC	3/18/05	GM
	WCRC/TWP/WCOC	1/17/05	GM
	WCRC/TWP/WCOC	8/2/04	GM
	WCRC/TWP	3/31/04	GM
	WCRC/TWP	7/25/03	GM
	DRAWN BY	DESIGNED BY	DATE
	GM	GM	5/07/03

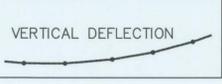
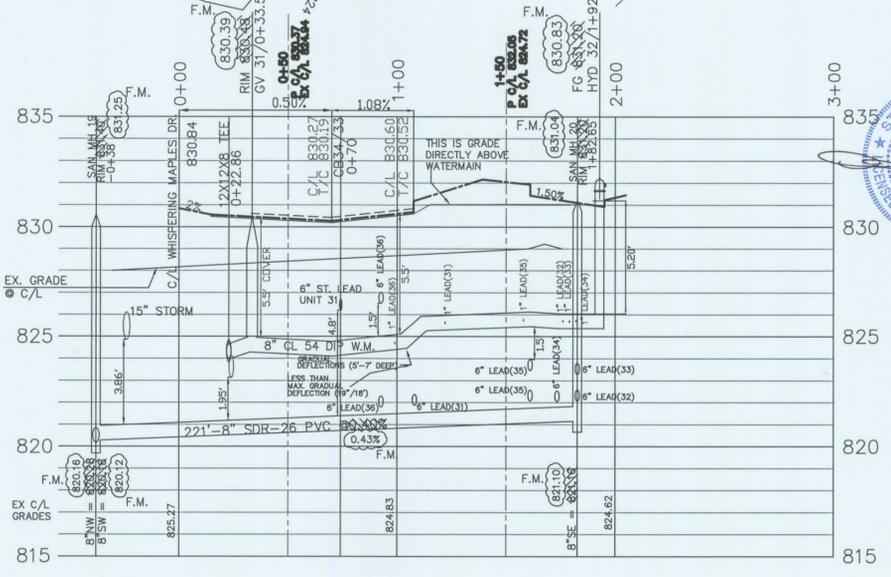
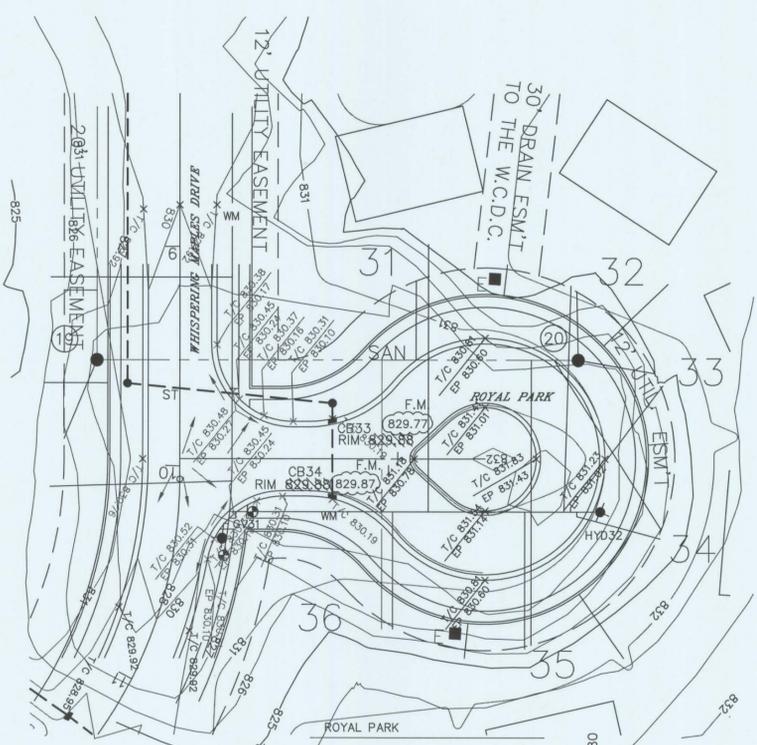
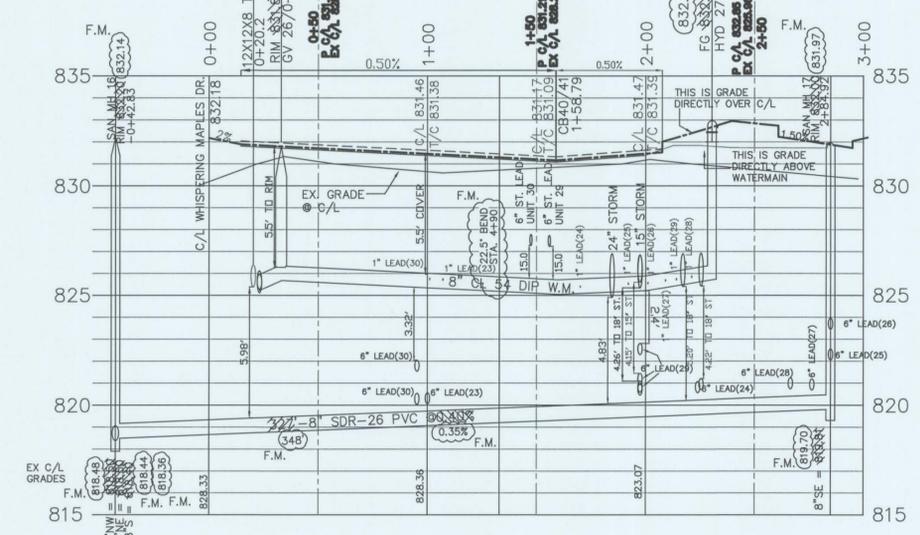
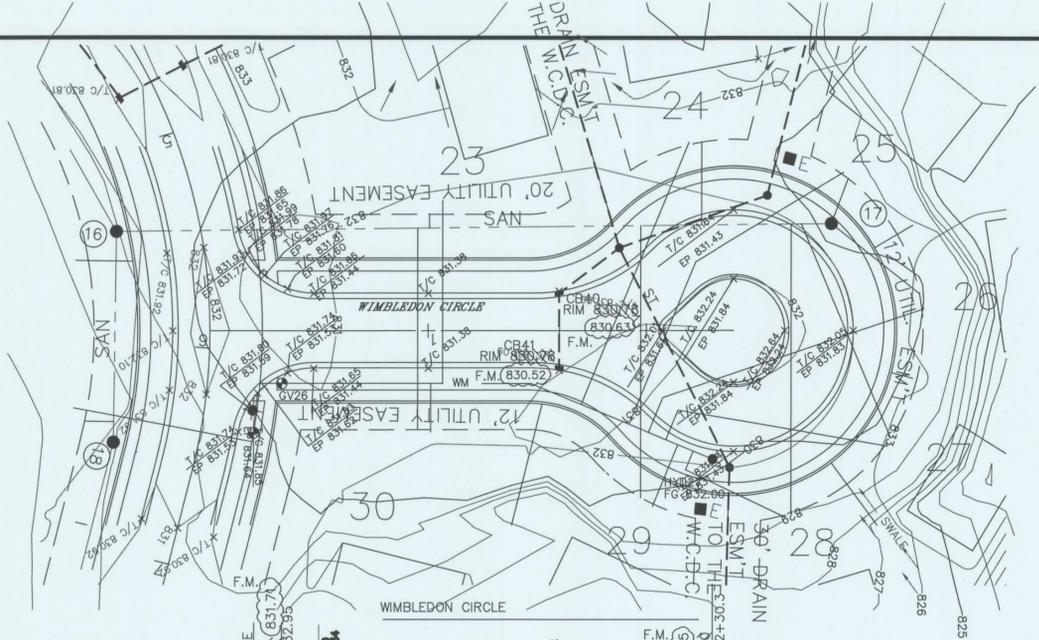
ST. JAMES WOODS II

WIMBLEDON CIR/ROYAL PARK STORM, WATER, & SANITARY PLAN & PROFILE

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734)481-1322  
 FAX (734)481-2215

SCALE: HOR 1" = 40' VER 1" = 4'

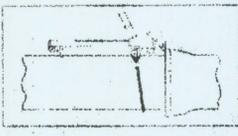
JOB NO. 00068  
 SHEET NO. 23 OF 42



**U.S. PIPE** Assembly of 4"-24" TYTON JOINT® Pipe continued

Figure 9. Jack Method of Disassembly

Joints 10" thru 24" may be disassembled by placing jack on plain end as indicated with lug on back end of rack bearing on face of bell. Motion of jack handle causes lug on rack to push against face of bell and move plain end out of socket.



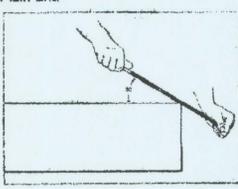
Assembly with Field Cut Pipe

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4-inch at an angle of about 30 degrees with the center line of the pipe

(Fig. 10). This can be done quite easily with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.

Figure 10. Conditioning Field Cut Plain End

The outside edge of field cut plain end pipe may be conditioned for use by filing or grinding a small bevel at an angle of about 30°.



Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches	
		18 ft. Length	Approximate Radius in Feet of Curve Produced by Succession of Joints
4	5°	19	205
6	5°	19	205
8	5°	19	205
10	5°	19	205
12	5°	19	205
14	4°	15	260
16	4°	15	260
18	3°	11	345
20	3°	11	345
24	3°	11	345
30	3°	11	345
36	3°	11	345
42	3°	12*	382*
48	3°	12*	382*

\*20-foot length

I-6

TP 4

NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

**BENCHMARK DATA (U.S.G.S.)**

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90° NORTH AND 55° WEST OF NW CORNER, SECTION 20.  
ELEVATION ..... 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35° NORTH AND 35° EAST OF NW PROPERTY CORNER (PARCEL 12-20-004).  
ELEVATION ..... 826.67

LEGEND

R.O.W.	---
PROP. CENTERLINE	---
EXIST. CENTERLINE	---
TOP OF CURB	---



110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

**AS-BUILT**  
1/16/09  
REVISED 6/2/09

AS-BUILT LEGEND  
5/16/09 ORIGINAL CONSTRUCTION PLAN DESIGN

F.M. AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

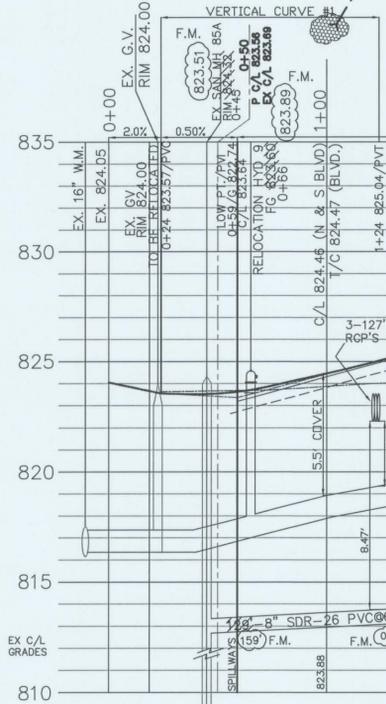
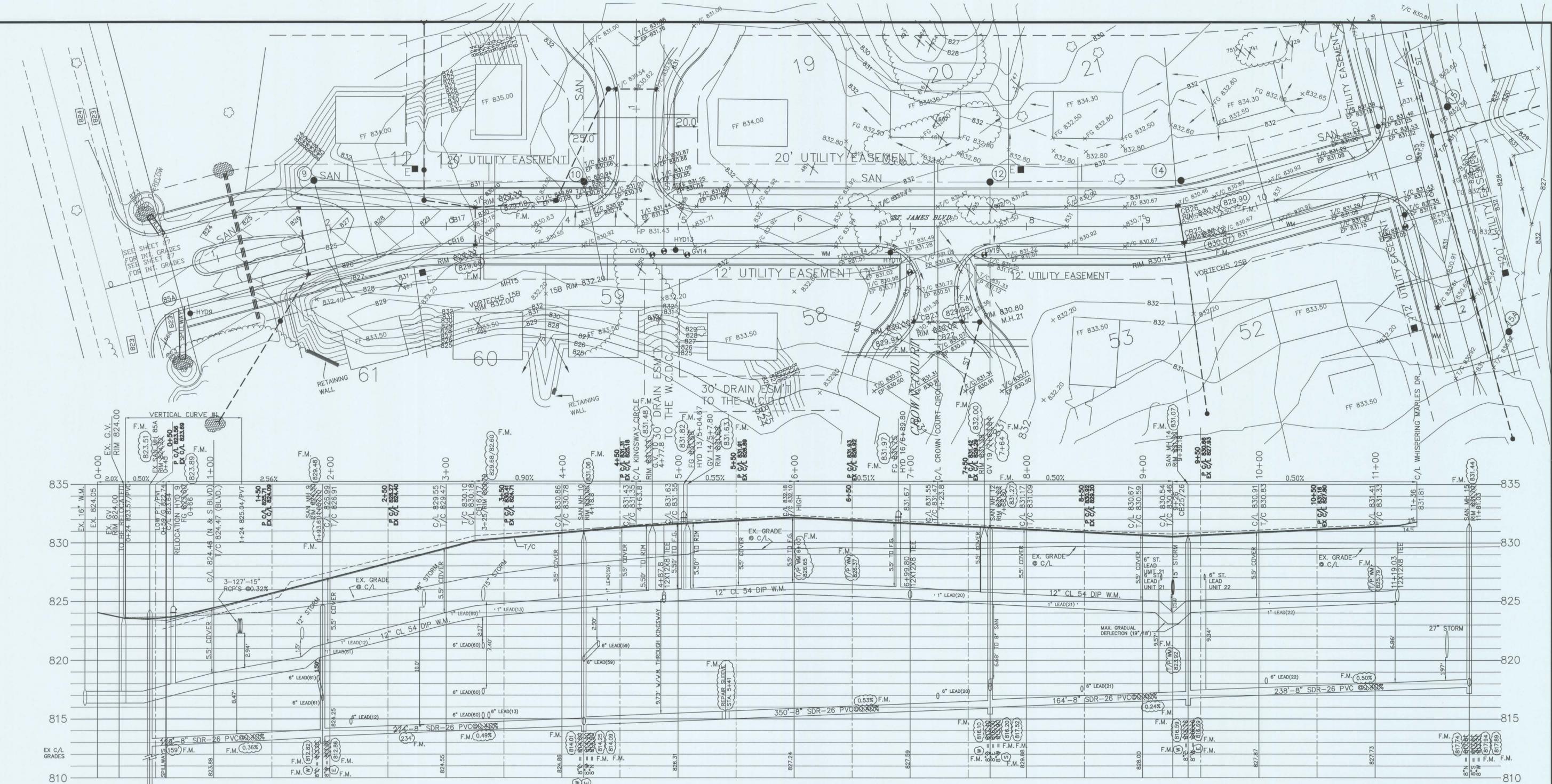
REVISIONS	ITEM	DATE	BY
	TWP/WCDC	2/20/07	GM
	TWP	8/4/05	GM
	TWP	7/11/05	GM
	DEQ/TWP/WCDC	3/18/05	GM
	WCRC/TWP/WCDC	1/17/05	GM
	WCRC/TWP/WCDC	8/2/04	GM
	WCRC/TWP	3/31/04	GM
	WCRC/TWP	7/25/03	GM

**ST. JAMES WOODS II**

WIMBLEDON CIR/ROYAL PARK STORM, WATER, & SANITARY PLAN & PROFILE

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
CIVIL ENGINEERS & LAND SURVEYORS  
(734) 481-1322  
FAX (734) 481-2215

SCALE  
HOR 1" = 40'  
VER 1" = 4'  
JOB NO. 0006B  
SHEET NO. 23 OF 42



VERTICAL CURVE #1  
 G(1)=0.50%  
 G(2)=2.56%  
 A=2.06  
 L=1.00  
 e=0.234  
 K=48.54

STATION	TANGENT	d	CURVE
0+24	823.57	0	823.57
0+44	823.46	0.078	823.54
0+64	823.51	0.20	823.71
0+84	824.02	0.089	824.11
1+04	824.53	0.022	824.55
1+24	825.04	0	825.04

NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

**BENCHMARK DATA (U.S.G.S.)**

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90° NORTH AND 55'± WEST OF NW CORNER, SECTION 20.  
 ELEVATION ..... 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35'± NORTH AND 35'± EAST OF NW PROPERTY CORNER (PARCEL 12-20-200-004).  
 ELEVATION ..... 826.67

LEGEND  
 R.O.W. -----  
 PROP. CENTERLINE -----  
 EXIST. CENTERLINE -----  
 TOP OF CURB -----

**AS-BUILT**  
 1/16/09  
 REVISED 6/2/09

AS-BUILT LEGEND  
 5716.000 ORIGINAL CONSTRUCTION  
 PLAN DESIGN



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
 110 MAIN STREET  
 DUNDEE, MI 48131  
 (734) 823-5080

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

REVISIONS

ITEM	DATE	BY	
TWP	8/4/05	GM	
TWP	7/11/05	GM	
DEQ/TWP/WCDC	3/18/05	GM	
WCRC/TWP/WCDC	1/17/05	GM	
WCRC/TWP/WCDC	8/2/04	GM	
WCRC/TWP	3/31/04	GM	
WCRC/TWP	7/25/03	GM	
WCRC	5/22/03	GM	
DRWN BY	DATE	DESIGNED BY	DATE
GM	2/20/07	GM	5/07/03

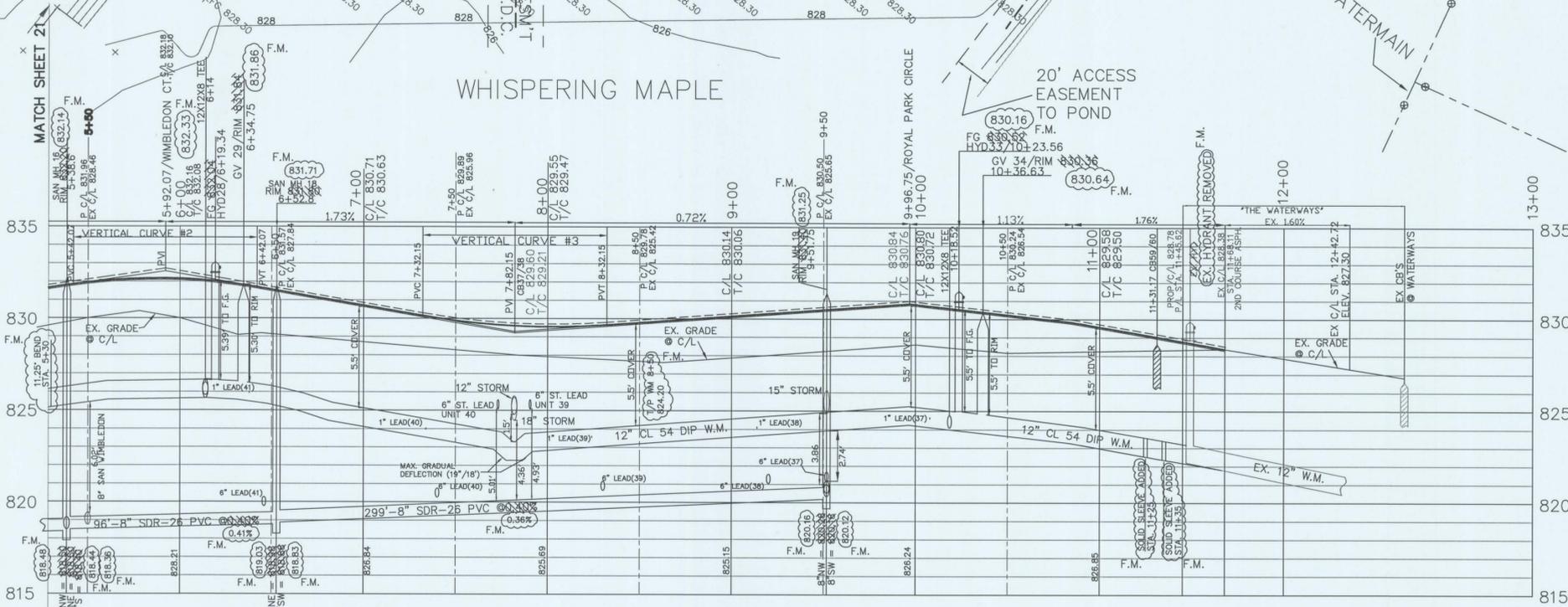
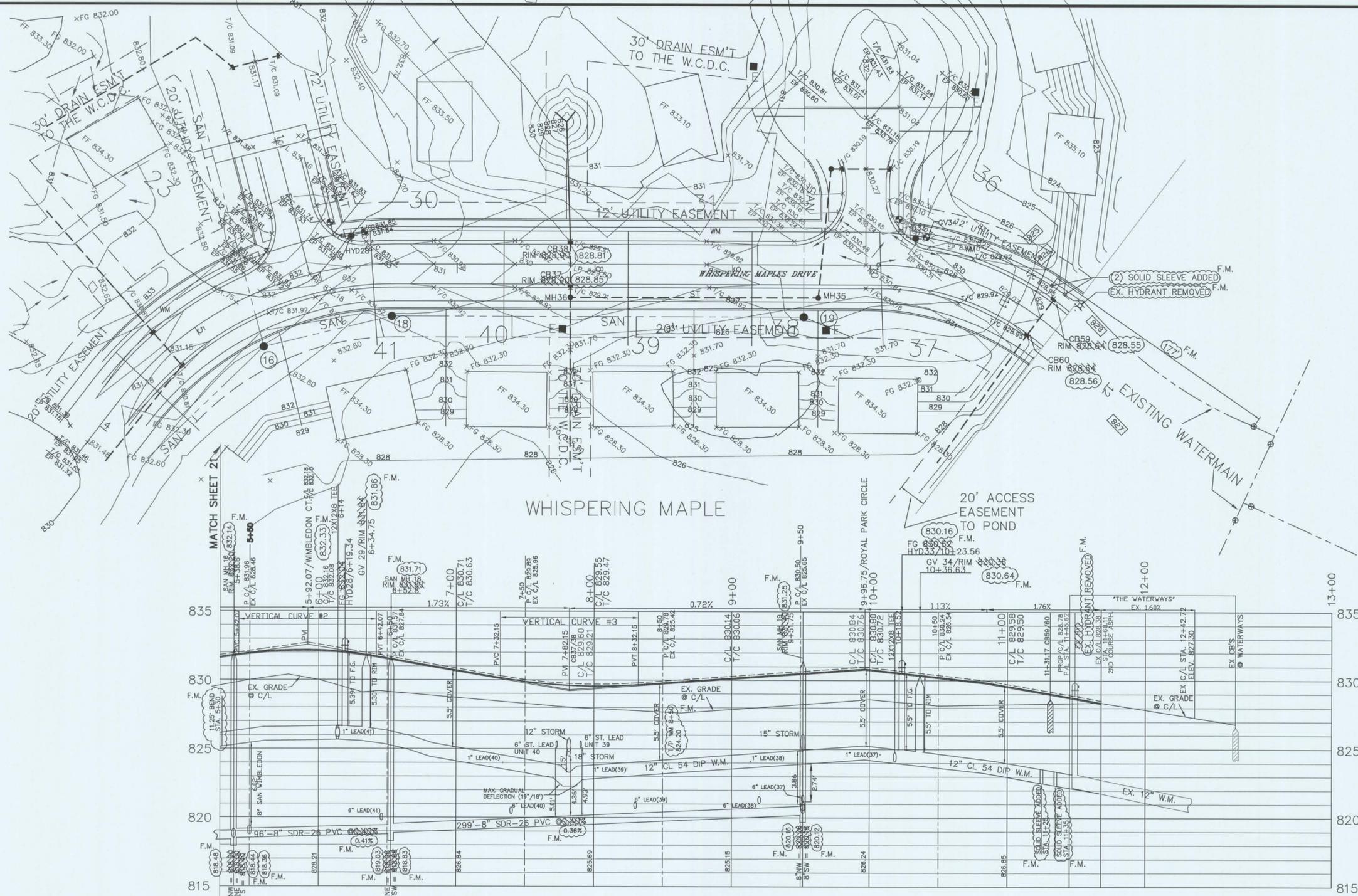
**ST. JAMES WOODS II**

ST. JAMES BLVD. STORM SANITARY, WATER, AND PAVING PLAN & PROFILE

E.P. KUBISKE & ASSOCIATES, INC.  
 1430 E. MICHIGAN AVE.  
 YPSILANTI, MI 48198-5906  
 CIVIL ENGINEERS & LAND SURVEYORS  
 (734)481-1322  
 FAX (734)481-2215

SCALE  
 HOR 1" = 40'  
 VER 1" = 4'

FIELD BOOK NO.  
 JOB NO.  
 00068  
 SHEET NO.  
 22 OF 42



LEGEND

R.O.W.	-----
PROP. CENTERLINE	-----
EXIST. CENTERLINE	-----
TOP OF CURB	-----

**AS-BUILT**  
1/16/09  
REVISED 6/2/09

AS-BUILT LEGEND

5716.000 ORIGINAL CONSTRUCTION PLAN DESIGN

F.M. AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.



AS-BUILT PLANS PREPARED BY:  
**DAVID ARTHUR CONSULTANTS INC.**  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080

VERTICAL CURVE #2				VERTICAL CURVE #4			
G(1)=-1.43%				G(1)=0.66%			
G(2)=-1.73%				G(2)=1.43%			
A=3.16				A=2.09			
L=1.00				L=1.00			
e=0.395				e=0.261			
d=0.099				d=0.065			
STATION	TANGENT	d	CURVE	STATION	TANGENT	d	CURVE
5+42.07	831.86	---	831.86	4+24.60	831.22	---	831.22
5+67.07	832.21	0.099	832.11	4+49.60	831.06	0.065	831.13
5+92.07	832.57	0.395	832.18	4+74.6	830.89	0.261	831.15
6+17.07	832.14	0.099	832.04	4+99.6	831.25	0.065	831.32
6+42.07	831.71	---	831.71	5+24.6	831.61	---	831.61

VERTICAL CURVE #3			
G(1)=1.73%			
G(2)=0.72%			
A=2.09			
L=1.00			
e=0.306			
d=0.077			
STATION	TANGENT	d	CURVE
7+32.15	830.15	---	830.15
7+57.15	829.72	0.077	829.80
7+82.15	829.29	0.306	829.60
8+07.15	829.47	0.077	829.55
8+32.15	829.65	---	829.65

NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

**BENCHMARK DATA (U.S.G.S.)**

ARROW ON HYDRANT, WEST SIDE OF LOHR ROAD APPROXIMATELY 90'± NORTH AND 55'± WEST OF NW CORNER, SECTION 20.  
ELEVATION ..... 826.81

ARROW ON HYDRANT, EAST SIDE OF LOHR ROAD APPROXIMATELY 35'± NORTH AND 35'± EAST OF NW PROPERTY CORNER (PARCEL 12-20-200-004).  
ELEVATION ..... 826.67

REVISIONS		
ITEM	DATE	BY
TWP	7/11/05	GM
WCDC	4/28/05	GM
DEQ/TWP/WCDC	3/18/05	GM
WCRC/TWP/WCDC	1/17/05	GM
WCRC/TWP/WCDC	8/2/04	GM
WCRC/TWP	3/31/04	GM
WCRC/TWP	7/25/03	GM
WCRC	5/22/03	GM
2/20/07	GM	DESIGNED BY DATE
8/4/05	GM	5/07/03

**ST. JAMES WOODS II**

WHISPERING MAPLES STORM SANITARY, WATER, AND PAVING WATERWAYS CONNECTION

E.P. KUBISKE & ASSOCIATES, INC.  
1430 E. MICHIGAN AVE.  
YPSILANTI, MI 48198-5906  
(734)481-1322  
FAX (734)481-2215

SCALE  
HOR 1" = 40'  
VER 1" = 4'

JOB NO.  
00068

SHEET NO.  
21A OF 42

**U.S. PIPE** Assembly of 4"-24" TYTON JOINT Pipe continued

Figure 9. Jack Method of Disassembly

Joints 10" thru 24" may be disassembled by placing jack on plain end as indicated with lug on back end of rack bearing on face of bell. Motion of jack handle causes lug on rack to push against face of bell and move plain end out of socket.



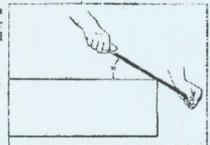
Assembly with Field Cut Pipe

When pipe are cut in the field, the cut end may be readily conditioned so that it can be used to make up the next joint. The outside of the cut end should be beveled about 1/4-inch at an angle of about 30 degrees with the center line of the pipe.

(Fig. 10). This can be done quite easily with a coarse file or a portable grinder. The operation removes any sharp, rough edges which otherwise might injure the gasket.

Figure 10. Conditioning Field Cut Plain End

The outside edge of field cut plain end pipe may be conditioned for use by filing or grinding a small bevel at an angle of about 30°.

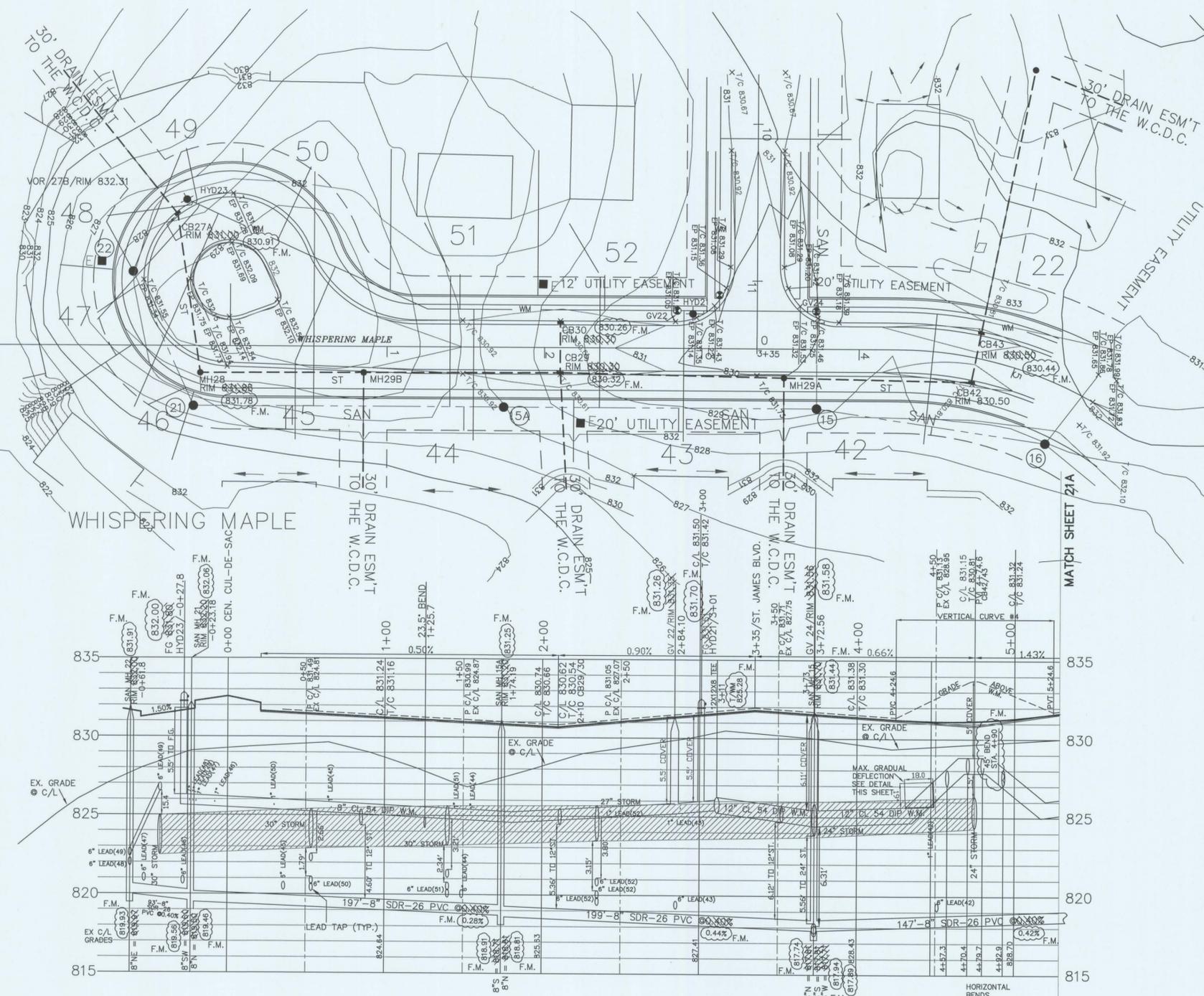


Maximum Deflection Full Length Pipe

Size of Pipe	Maximum Joint Deflection in Degrees	Deflection in Inches		Approximate Radius in Feet of Curve Produced by Succession of Joints	
		18 ft. Length	18 ft. Length	18 ft. Length	18 ft. Length
4	6°	19	205		
6	5°	19	205		
8	5°	19	205		
10	5°	19	205		
12	5°	19	205		
14	4°	15	260		
16	4°	15	260		
18	3°	11	345		
20	3°	11	345		
24	3°	11	345		
30	3°	11	345		
36	3°	11	345		
42	3°	12*	382*		
48	3°	12*	382*		

\*90-foot length

TP 4



LEGEND

R.O.W. -----

PROP. CENTERLINE -----

EXIST. CENTERLINE -----

TOP OF CURB -----

**AS-BUILT**  
1/16/09  
REVISED 6/2/09

AS-BUILT LEGEND

5716.00 ORIGINAL CONSTRUCTION PLAN DESIGN

AS-BUILT INFORMATION FROM FIELD INSPECTION NOTES BY PITTSFIELD TOWNSHIP ENGINEERING DEPARTMENT DATED APRIL 26, 2006 THROUGH NOVEMBER 3, 2008, AND FIELD OBSERVATIONS BY DAVID ARTHUR CONSULTANTS, INC. ON DECEMBER 11, 2008. FIELD MEASURED ELEVATIONS ARE BASED ON U.S.G.S. (NAD 1983) DATUM.

AS-BUILT PLANS PREPARED BY:

DAVID ARTHUR CONSULTANTS, INC.  
110 MAIN STREET  
DUNDEE, MI 48131  
(734) 823-5080



VERTICAL CURVE #2				VERTICAL CURVE #4			
G(1)=1.43%				G(1)=0.66%			
G(2)=1.73%				G(2)=1.43%			
A=3.16				A=2.09			
L=1.00				L=1.00			
e=0.395				e=0.261			
d=0.099				d=0.065			
K=31.65				K=47.85			
STATION	TANGENT	d	CURVE	STATION	TANGENT	d	CURVE
5+42.07	831.86	---	831.86	4+24.60	831.22	---	831.22
5+67.07	832.21	0.099	832.11	4+49.60	831.06	0.065	831.13
5+92.07	832.57	0.395	832.18	4+74.6	830.89	0.261	831.15
6+17.07	832.14	0.099	832.04	4+99.6	831.25	0.065	831.32
6+42.07	831.71	---	831.71	5+24.6	831.61	---	831.61

VERTICAL CURVE #3			
G(1)=1.73%			
G(2)=0.72%			
A=3.16			
L=1.00			
e=0.306			
d=0.077			
K=40.82			
STATION	TANGENT	d	CURVE
7+32.15	830.15	---	830.15
7+57.15	829.72	0.077	829.80
7+82.15	829.29	0.306	829.60
8+07.15	829.47	0.077	829.55
8+32.15	829.65	---	829.65

NOTE: SUBTRACT 0.387 FROM EXISTING ELEVATIONS TO OBTAIN N.A.V.D. '88 DATUM

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ELEVATION ..... 826.67

REVISIONS		
ITEM	DATE	BY
TWP	8/4/05	GM
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WCRC/TWP/WCDC	1/17/05	GM
WCRC/TWP/WCDC	8/2/04	GM
WCRC/TWP	3/31/04	GM
WCRC/TWP	7/25/03	GM
WCRC	5/22/03	GM
DATE	DATE	
2/20/07	GM	
DESIGNED BY	DATE	
GM	5/07/03	

ST. JAMES WOODS II	
WHISPERING MAPLES STORM SANITARY, WATER, AND PAVING PLAN & PROFILE	
E.P. KUBISKE & ASSOCIATES, INC.	
1430 E. MICHIGAN AVE. YPSILANTI, MI 48198-5906 CIVIL ENGINEERS & LAND SURVEYORS (734)481-1322 FAX (734)481-2215	
SCALE HOR 1" = 40' VER 1" = 4'	JOB NO. 00068
FIELD BOOK NO.	SHEET NO. 21 OF 42

