Drain: לפנה | Drain #: 162

Improvement/Arm: אבנה אדורטנדומן

Operator: לבוטואנג איסא | Date: 5-13-04

Drain Classification: Urban/Rural Year Installed: 1987

GIS Drain Input Checklist

- Pull Source Documents for Scanning
- Digitize & Attribute Tile Drains
- Digitize & Attribute Storm Drains
- Digitize & Attribute SSD
- Digitize & Attribute Open Ditch
- Stamp Plans
- Sum drain lengths & Validate
- Enter Improvements into Posse
- Enter Drain Age into Posse
- Sum drain length for Watershed in Posse
- Check Database entries for errors

Gasb 34 Footages for Historical Cost Drain Length Log

Drain-Improvement: JOHN OSBORN - RECONSTRUCTION

Dt. =	Length Length Length			T .	ele Kapiede e	
Drain Type:	Size:		(DB Query)	Length Reconcile	Price:	
			,	- sectione	Frice:	Cost:
ecp	21"	1528'	1081	-4.121		
	24"	1585'		-447'		
		1365	1515	-70'		
4051						
BPEN DITCH		52'	18'	-34	.′	
			·		<u> </u>	
						
	Sum:	3145	2614'	<u></u> - <u>-</u>	10	
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al Report: 3/6	<u>5'</u>					
mments:						
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PORTIONS OF 21		CP RELOCAT	ED For 14	WALL	RELOCATI	10M
PEN DITCH EN	CLOSED IN	Box CULV	ert for	100世 ~T	ālil ka	RECORDST-
UCTBA.						べくてのいらて ー





773-6110 Ext.-19--776-9626

TO: Hamilton County Drainage Board

RE: John Osborn Drain

Noblesville, G.d. 48060 Tirkun 7. 198_8
FEB 8 1988

HAMILTON COUNTY DRAINAGE BOARD

SECRETARY

John Osborn Main Ditch

Attached is a petition for the reconstruction of the John Osborn Drain. The petition is accompanied by plans and calculations and is submitted by C. Michael Verble for Walnut Creek Woods and Bruce A. Cordingley for Bridlebourne. These property owners represents forty-eight (48%) percent of the drainage shed and will pay the cost for reconstruction.

The proposed project will involve the reconstruction of the open and tile portions of the original John Osborn Drain. The open portion will be dredged from Towne Road West 212 feet. The tile portion will be replaced with a 21" RCP and 24" RCP. This portion of the project will consist of 1440 feet of 24" RCP and 1780 feet of 21" RCP for a total of 3220 feet of tile. The tile portion will begin near the NorthEast corner of Lot 37 in Bridlebourne, in Block G of that plat. The plans and profile of the project is shown in the four (4) page set of plans by Schneider Engineering dated August 27, 1987 and file stamped October 9, 1987. The portion of the drain from STA 42+26 (Towne Road) to STA 49+00 will remain unchanged.

I recommend the Board vacate the original protion of the John Osborn Drain from Station 0 to Station 11+50. This portion of the drain is within the Bridlebourne Subdivision. The length of the main drain will be changed 4900 feet to 4106 feet. Two (2) Arms of the drain will be added and are discussed below.

I recommend the petitioners be instructed to 1.) Provide a contract or cost estimate for the reconstruction 2.) Provide a Performance Bond or Letter of Credit

for 100% of the contract price or estimate 3.) Be given May 15, 1988 as a completion date and 4.) Be required to submit to the Surveyor a set of As Built Drawings showing pipe length, location, TC's and inverts.

I also recommend to the Board that the minimum assessment for the John Osborn Drain be increased to \$25.00. This will increase the annual assessment from the existing \$487.00 annual assessment to \$1100.44. This includes adding the following tracts to the assessment because of drainage facilities constructed and proposed in Bridlebrourne and Walnut Creek Woods.

13-05-00-00-016.00 41.52ac-5ac assessed 13-05-00-00-016.001 5.0ac-5ac assessed

13-05-00-00-016.201 31.739ac-31.739ac assessed

All of Bridlebourne Sections 1 and 2, parts of which were assessed originally along with tracts 13-05-00-00-001.204 and 13-05-00-001.104 in total.

BRIDLEBROURNE ARM

Attached is a petiton, non-enforcement request, plans, calculations and assessment roll for the Bidrlebourne Arm of the John Osborn Drain.

This drain consists of portions of the drainage facilities for Sections 2 and 3 of Bridlebourne. These portions will be described below.

I have reviewed the submittals and petition and have found each to be in proper form.

I have made a personal inspection of the land described in the petition. Upon doing so, I believe that the drain is practicable; will improve the public health; benefit a public highway and be of public utility; and that the costs, damages and expenses of the proposed drain will probably be less than the benefits accuring to the owners of land likely to be benefitted. The drain will consist of the following:

- Section 2: Structure 104 at the South East corner of Lot 39 North to STR 103, thence North from STR 103 to STR 102; thence East to the East line of Lot 63 as per grading plan for Bridlebourne Subdivision Section 2 by Schneider Engineering with last revision dated June 8, 1987 and file stamped October 20, 1987.
- Section 3: Starting at the West line of Lot 62 (East line of Lot 63 above) and run East to STR 114: thence North East to STR 110; thence South East to STR 109; thence South East in an open ditch to the

East line of Common Area Block "G" where it enters the main John Osborn Drain as reconstructed. Also to be included is the 12" RCP between Structure 110 and Strucure 111. This as per grading plan for Bridlebourne Subsivision Section 3 by Schneider Engineering with last revision dated October 9, 1987 and file stamped October 30, 1987.

The lengths involved are as follows:

 Open Ditch
 465 feet
 12" RCP
 22 feet

 15" RCP
 290 feet
 18" RCP
 412 feet

The total length of the Bridlebourne Arm will be 1189 feet.

I have reviewed the plans and believe the drain will benefit each lot equally. Therefore, I recommend each lot be assessed equally. I recommend a maintenance assessment of \$25.00 per lot, \$2.00 per acre for roadways and Common Areas, with a \$25.00 minimum.

WALNUT CREEK WOODS ARM

Attached is a petition, non-enforcement request, plans, calculations, quanity summary and assessment roll for the Walnut Creek Woods Arm of the John Osborne Drain. I have reviewed the submittals and petition and have found each to be in proper form.

I have made a personal inspection of the land described in the petition. Upon doing so, I believe that the drain is practicable; will improve the public health; benefit a public highway and be of public utility; and that the costs, damages and expenses of the proposed drain will probably be less than the benefits accuring to the owners of land likely to be benefitted. The drain will consist of the following.

6" SSD - 525' 15" RCP - 1890' 24" RCP - 240'

The total length of the drain will be 4705 feet.

Subsurface Drain (SSD) which will be taken as regulated drain for this project is shown on sheet S-6 and consists of the line in the rear of lots 9 & 10 along with the line in the rear of lots 5 & 6.

I have reviewed the plans and believe the drain will benefit each lot equally. Therefore, I recommend each lot be assessed equally. I recommend a maintenance assessment of \$25.00 per lot, \$2.00 per acre for roadways, with a \$25.00 minimum.

The maintenance responsibility for Lakes 1 and 2 will be upon the Homeowners Association. The maintenance of the inlets and outlets for the lakes will be part of the regulated drains. The detention areas on lots 8; 4,6 and 7; 2 and 3 and lot 1 are to be maintained as regulated drain only to ensure that the need storage volume is maintained and not filled in.

The offsite storm line shown on sheet 13 is to be included as part of the regulated drain. This line is between Str. #05-101 and Str. #101.

I recommend a hearing for the above reconstruction and arms be set for February 8, 1988.

Kenton C. Ward,

Hamilton County Surveyor

KCW/no/jh

BANK ONE, INDIANAPOLIS, NA INDIANAFOLIS. INDIANA 46277

DATE: 270CT87

IRREVOCABLE CREDIT NO. S-2917-G BOARD OF COUNTY COMMISSIONERS OF HAMILTON COUNTY C/O AUDITORS OFFICE NOBLESVILLE, INDIANA 46060

GENTLEMEN:

WE HEREBY AUTHORIZE YOU TO VALUE ON US FOR THE ACCOUNT OF BRIDLEBOURNE DEVELOPMENT CO. . AN INDIANA GENERAL PARTNERSHIP P.O. BOX 44287 INDIANAPOLIS, INDIANA 46244

FOR A SUM OR SUMS IN U.S. DOLLARS NOT EXCEEDING A TOTAL OF SEVENTY THOUSAND THREE HUNDRED EIGHTY SEVEN AND 00/100 USD

*******70,387.00

AVAILABLE BY DRAFTS AT SIGHT DRAWN ON BANK ONE, INDIANAPOLIS, NA. INDIANAPOLIS, INDIANA. ACCOMPANIED BY:

PURPOSE

PERFORMANCE BOND RELATED TO OFFSITE DRAINAGE AT BRIDLEBOURNE SUBDIVISION.

DRAFTS MUST BE PRESENTED TO THE DRAWEE NOT LATER THAN 140CT88 AT OUR COUNTERS.

ALL DRAFTS MUST BE MARKED, "DRAWN UNDER BANK ONE, INDIANAPOLIS, NA, INDIANAPOLIS, IN. CREDIT NO. S-2917-G ".

WE HEREBY AGREE WITH YOU THAT DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS CREDIT SHALL BE DULY HONORED ON DUE PRESENTATION TO THE DRAWEE.

THIS CREDIT IS SUBJECT TO UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS (1983 REVISION) ICC PUBLICATION NO. 400.

YOURS VERY TRULY,

BANK ONE, INDIANAPOLIS, NA

AUTHORIZED SIGNATURE

CERTIFICATE OF COMPLETION AND COMPLIANCE

TO: HAMILTON COUNTY SURVEYOR

RE:

John Osborn Legal Drain

I hereby certify that:

- 1.) I am a Registered Land Surveyor in the State of Indiana,
- 2.) I am familiar with the plans and specifications for the above referenced subdivision,
- 3.) I have personally observed and supervised the completion of the Drainage Facilities for the above referenced subdivision, and
- 4.) To the best of my knowledge, information and belief, the Drainage Facilities within the subdivision has been installed and completed in conformity with all plans and specifications.

Signature:

Date: 6/23/88

Type or Printed Name: John V. Schneider

Business Address: 3020 North Post Road, Indianapolis, Indiana 46226

Telephone: (317) 898-8282

INDIANA REGISTRATION NUMBER

14653

SEAL

HAN S & 1888 HAN S & DIVANAGE BOARD





776=9626

Noblesville, Ind. 46060 January 9, 1989

TO: Hamilton County Drainage Board

RE: John W. Osborn Drain

On December 5, 1988 I made an inspection of the reconstruction of the J.W. Osborn Drain. This is described in my January 7, 1988 report to the Board under the heading of John W. Osborn Main Ditch. At that time I found the work done on the main ditch to be complete and acceptable.

During the construction of the drain, two modifications were made. The first was the addition of an inlet East of Bridleborne. This was installed so as to intercept the storm sewer from Walnut Creek Woods. The second was extending the 24" RCP to a point fifty-two (52') feet West of Towne Road. The reconstructed drain is as follows: 52 feet Open Ditch 1528 feet 21" RCP 1585 feet 24" RCP

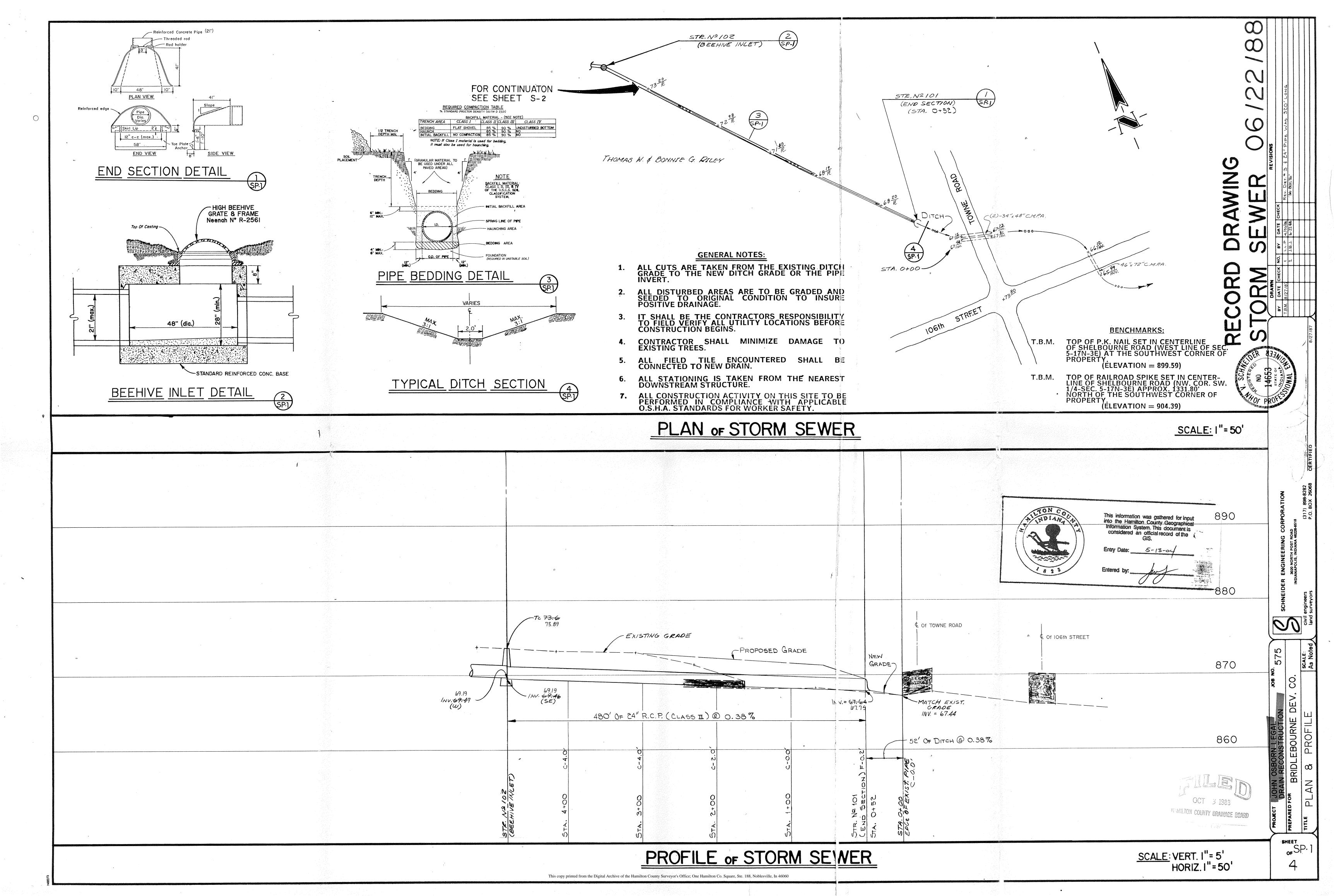
The original report should be revised so that the total length of the main ditch is now 3839 feet. Therefore, STA 49+00 is now 38+39 and STA 42+26 (Towne Road) is now 31+65.

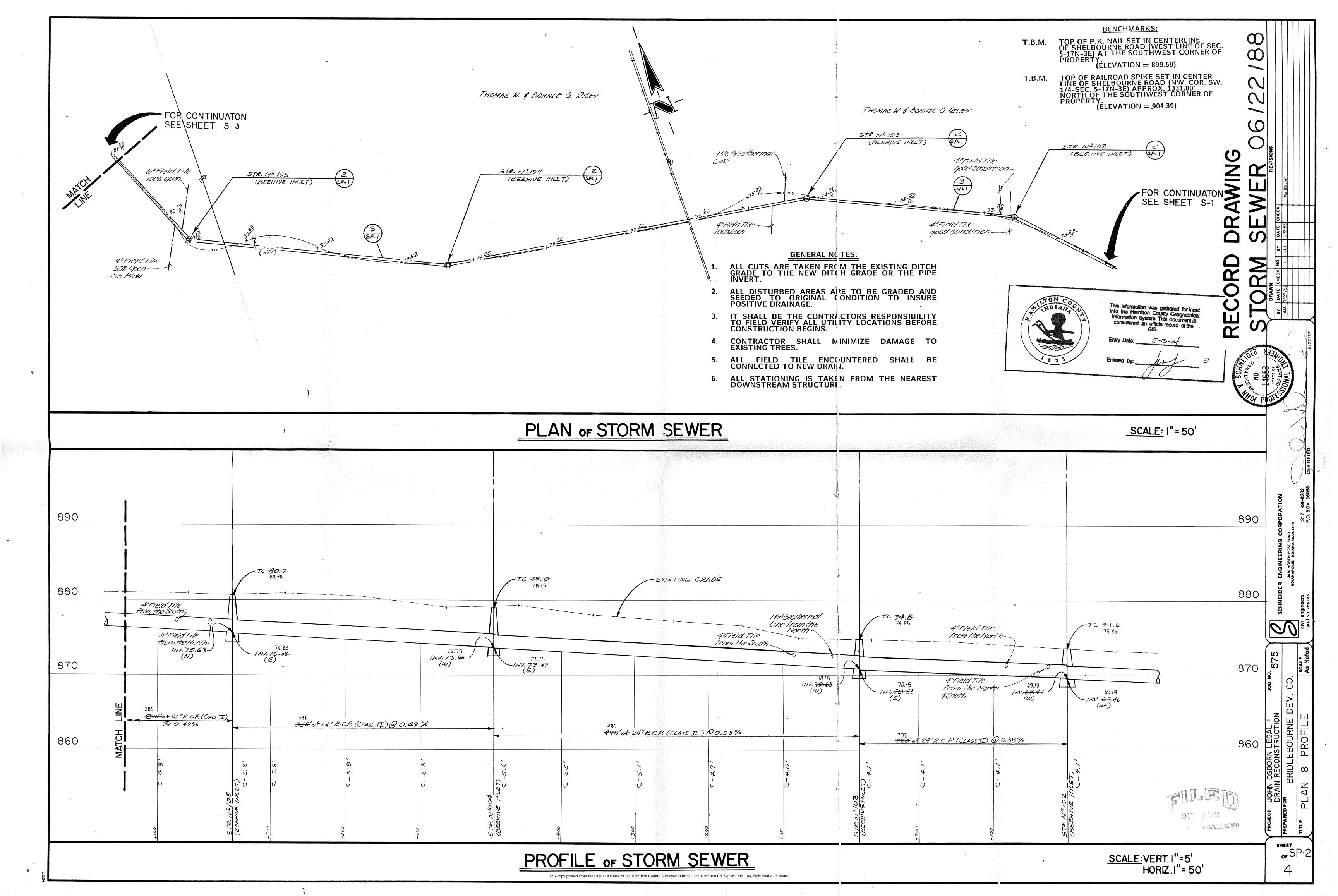
All submittals have been made by the developers engineers, Schneider Engineering. At this time I recommend the Board approve the drainage facilities as constructed.

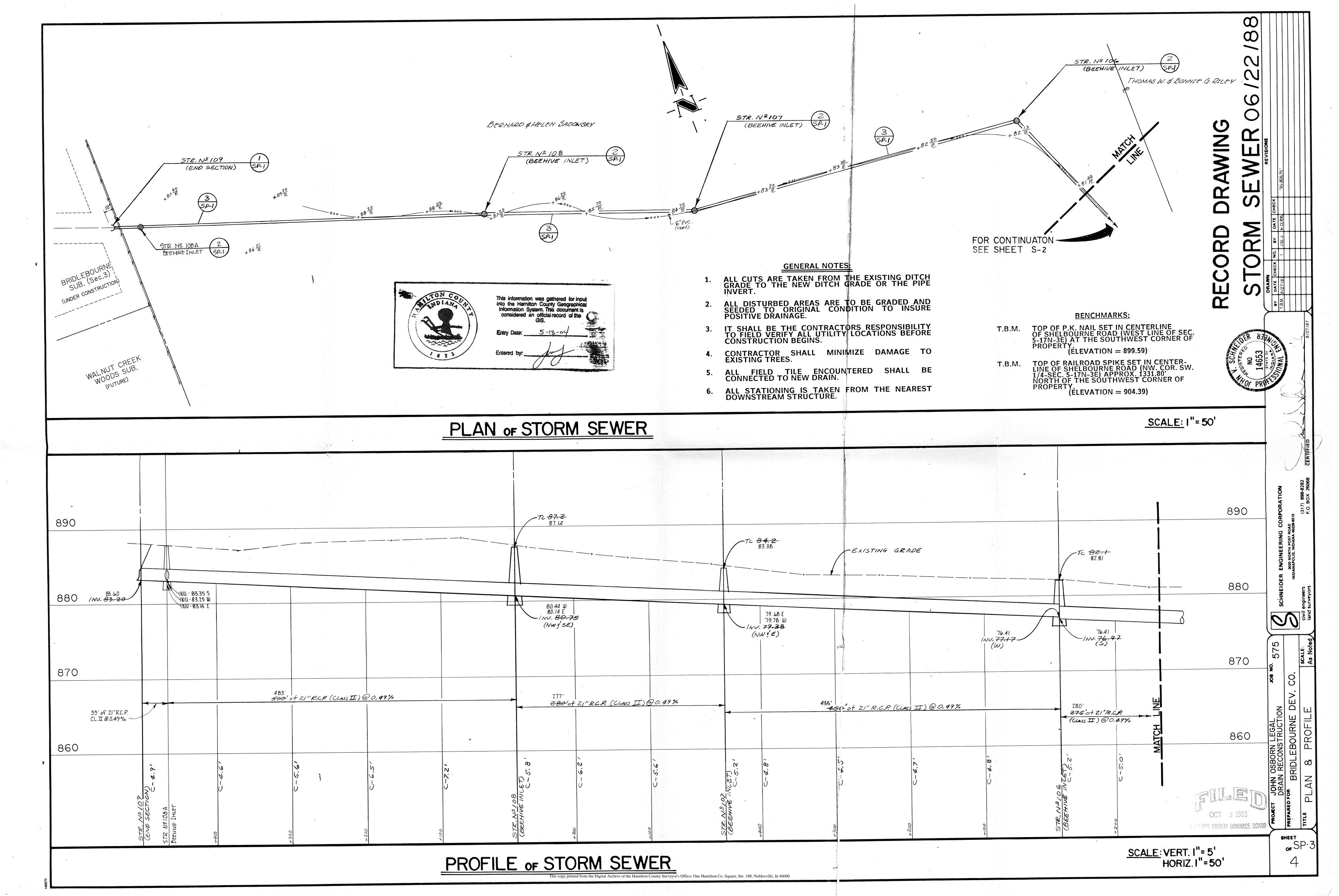
KCW/no

Kenton C. Ward

Hamilton Coun⊅y Surveyor







SCOPE OF WORK:

- A. Extent: The work required under this section consists of all excavating. filling, rough grading and related items necessary to complete the work indicated on the drawings and described in the specifications.
 - In general the items of work to be performed under this section shall include: clearing and grubbing, removal of frees and stumps (where required), protection of trees to remain, stripping and storage of topsoil, fill compaction and rough grading of entire site as indicated
- Excavated material that is suitable may be used for fills. All unsuitable material and all surplus excavated material not required shall be removed from the site. The location of dump and length of haul shall be the Contractor's responsibility.
- 3. Provide and place any additional fill material from off the site as may be necessary to produce the grades required. Fill obtained from off site shall be of kind and quality as specified for fills herein and the source approved by the Owner
- 4. The Contractor shall accept the site as he finds it and shall remove all trash, rubbish and debris from the site prior to starting
- B. Work not included: The following items of related work are specified and included in other sections of these spec

 - Excavation, grading and backfilling for utility lines.
- Storm drainage systems.
- Sanitary sewer systems.
- Water supply systems.
- Streets and paving.

2. BENCHMARKS:

Maintain carefully all bench mark me uments and other reference points; ected by engineer. if disturbed or destroyed, replace as

- REMOVAL OF TREES:
- A. Remove all trees and stumps from to be occupied by road and surfaced bese areas shall only be done as noted on areas. Removal of trees outsi drawings or approved by the wr
- B. All brush, stumps, wood an other refuse from the troonsite or burned with proper penits (where applicable). r refuse from the trees shall be buried

4 PROTECTION OF TREES.

- A. General Protection: The Contractor shall be responsible for the protection of tops, trunks and roots of existing trees on the project site that are to remain. Existing trees subject to construction damage shall be boxed. fenced or otherwise protected before any work is started; do not stockpile within branch spread. Remove interfering branches without injury to trunks and cover scars with tree paint.
- STRIPPING OF TOPSOIL
- Remove topsoil to a cepth (6 inches (or more if required)) from the areas to be occupied by rollis, which buildings, and parking areas. Pile and store topsoil at a location where it will not interfere with construction operations. Top soil shall be read by free from subsoil, debris and stones.
- DISPOSÍTION OF TLITIES:
- A. Rules and regulations governing the respective utilities shall be observed in executing all work under this section
- B. It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to his phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities before work is started. The contractor shall notify in writing the owners of the engineers of any changes, errors or omissions found on these plans or inthe field before work is started or resumes.
- C Where active utilities are encountered but not shown on the drawings, the Engineer shall be advised before work is continued.
- D. Inactive and abandoned utilities encountered in excavating and grading operations shall be reported to the Engineer. They shall be removed, plugged or capped as directed by the Engineer.
- 7. SITE GRADING:
- A. Grades: Do all cutting, filling, compacting of fills and rough grading required to bring entire project area to subgrade as shown on the drawings
- B. Rough Grading: The tolerance for paved areas shall not exceed 0.10 feet above established subgrade. All other areas shall not exceed 0.10 feet plus or minus the established grade. Provide roundings at top and bottom of banks and other breaks in grade.

SANITARY SEWER SYSTEMS

The work under this section includes all sanitary sewers, manholes, catch basins cleanouts, and related items, including estarating and backfilling, necessary to complete the work shown on the daying starting five feet outside the building walls. The ends of sewers shade tightly plugged or

capped at the terminal points, adjacent to buildings, of all such lines to the building drain a speci ed in the plumbing specifications and architectural drawings. MATERIALS:

SCOPE OF WORK

A. Sanitary Sewers:

- All gravity plastic sewer pipe and tings shall conform to ASTM D3034, SDR-35.
- Extra strength vitrified clay wer pe conforming to ASTM C-700 latest revision, with compression and conforming to ASTM C-425 latest revision.
- ABS Sewer Pipe and fittings still conform to ASTM D2680 latest

B. Manholes:

- Precast reinforced co icr manhole sections and steps shall conform to ASTM C-478 lat
- Castings shall be distortion or other defects. They shall be smooth and well-cleaned by shotblasting or by some other approved method. They shall be coated with asphalt paint which shall result in a smooth coating, tough and tenacious when cold, not tacky or brittle. They shall be gray iron meeting ASTM A-48 latest revision. Manhole coers for sanitary sewer shall be Neenah Type R1040B with "F" aled pickhole.
- sections shall be jointed with either mastic in bulk, Joints - p type gaskets. The rubber type gaskets shall meet

APPLICAT

- A. Permits and sides: The intent of this section of the specifications is that the contractors sid on the work covered herein shall be based upon the drawings and specifications but that the work shall comply with all applicable codes and regulations as amended by any waivers. Contractor shall furnish all bonds necessary to get permits for cuts and connections to existing sewers.
- B. Local Standards: The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department
- C. Existing Improvements: Maintain in operating condition all active utilities, sewers and other drains encountered in the sewer installation. Repair to the satisfaction of the owner any damage to existing active improvements.
- D. Workmanship: To conform to all local, state and national codes and to be approved by all local and state agencies having jurisdiction.
- E. Trenching: Lay all pipe in open trenches, except when the local authority gives written permission for tunneling. Open the trench sufficiently ahead of pipe-laying to reveal any obstructions. The width of the trench shall be the inside pipe diameter plus 24 inches for 12 inches above the pipe. Sheet and brace trench as necessary to protect workmen and adjacent structures. All trenching to comply with Occupational Safety and Health Administration Standards. Keep trenches free from water whileconstruction is in progress. Under no circumstances lay pipe or appurtenances in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.
- F. Special Supports. Whenever, in the opinion of the Engineer, the soil at or below the pipe grade is unsuitable for supporting sewers and appurtenances specified in this section, such special support, in addition to those shown or specified, shall be provided as the Engineer may direct, and the contract
- G. Backfilling for a depth of at least 12 inches above the top of the pipe, backfill with earth or granular material free from large stones, rock fragments, roots or sod. Tamp this backfill for us ly, taking care not to fragments, roots or sod. Tamp this backfill for us ly, taking care not to disturb the pipe. For the remaining trenches the backfill with earth or granular material containing stones or rocks no. larger than 4 inches. Backfill under walks, parking areas, driveways an estrects shall be granular material only - thoroughly compacted, by yed methods. Trenches parallel to and within 10 feet of paved roadways shall be constructed the
- H. Manhole Inverts: Construct manhole flow en nels of concrete, sewer pipe or brick, smoothly finished and of semi-circular section conforming to the inside diameter of the connecting see as Make changes in size or grade gradually and changes in direction by curves. Provide such channels for all connecting sewers at each magnitude
- I. Infiltration: Furnish necessary equame to test sewers for infiltration. Infiltration rates shall not exceed the Local Standards. All sanitary sewer lines upon completion will be required pass a low pressure air test, unless otherwise directed by the City Engineer. Said test shall be conducted according to NCPI Standard N hod, and shall be witnessed by the City Inspector. Infiltration under the shall be witnessed by the City Inspector. Infiltration under the shall be witnessed by the City Inspector. Infiltration under the shall not exceed 200 gallons per inch on inside diameter of sewer pipe er hile of sewer in 24 hours and inclusive of all appurtenances within the son being tested such as manholes, house connections, etc.
- J. Flushing Sewers: Flush all salitary sewers except building sewers with water to obtain free flow win ash each line. Remove all silt and trash from appurtenances just prior to ceptance of work. appurtenances just prio
- K. Plastic Sewer Pipe Installation. Plastic sewer pipe shall be installed in accordance with A.S.T.M. D2321 per latest revision, and no plastic pipe shall exceed a deflection of 5%
- L. Storm Water Constants: No roof drains, footing drains and or surface water drains may be expected to the sanitary sewer systems, including temporary connection during construction
- M. Waterline Crossing If a horizontal distance of 10 feet cannot be maintained between he water line and the sanitary sewer line, the sewer maintained between the water line and the sanitary sene.
 must be constructed of water works grade ductile iron pipe with mechanical
- N. Utilities: It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to his phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities before work is started. The contractor shall notify in writing the owners or the engineer of any changes, errors or omissions found on these plans or in the field before work is started or resumed.
- O. Outfall sewers: All sanitary sewer connections to receiving sewers shall be constructed in accordance with drawings, subject however, to any modification required by the City of Carmel at the time installation is completed and to any adjustments needed for field conditions not adequately anticipated by the design drawings.

Office as soon after completion of construction as possible.

P. New Sewer Construction: The locations of laterals, along with any other construction changes are to be incorporated on the original construction drawings and "Record Drawing" prints submitted to Carmel City Engineer's

STORM SEWER SYSTEMS

SCOPE OF WORK

The work under this section includes all storm sewers, storm water inlets, and related items, including excavating and backfilling, necessary to complete the work shown on the drawings.

MATERIALS:

A: Storm Sewers:

- Reinforced concrete sewer pipe shall conform to ASTM C-76 latest revision with joints conforming to ASTM C-443 latest revision.
- Precast reinforced concrete manhole sections and steps shall conform to ASTM C-478 latest revision
 - Castings shall be of uniform quality, free from blow holes, porosity, hard spots shrinkage distortion or other defects. They shall be smooth and well-cleaned by shotblasting or by some other approved method. They shall be coated with asphalt paint which shall result in a smooth coating, tough and tenacious when cold, not tacky or brittle. They shall be gray iron meeting ASTM A-48 latest revision.
 - Joints manhole sections shall be jointed with either mastic in bulk, stick or rubber type gaskets. The rubber type gaskets shall meet ASTM C-443 latest revision.

C: SUBDRAINS:

- Perforated plastic pipe subdrains shall conform to ASTM.
- 3. ¶ APPLICATION:
- A: Permits and Codes: The intent of this section of the specifications is that the contractor's bid on the work covered herein shall be based upon the drawings and specifications but that the work shall comply with all applicable codes and regulations as amended by any waivers. Contractor shall furnish all bonds necessary to get permits for cuts and connections to existing sewers.
- B: Local Standards: The term "Local Standards" as used herein means the standards of design and construction of the respective municipal department or utility company
- C: Existing Improvements: Maintain in operating condition all active utilities, sewers and other drains encountered in the sewer installation. Repair to the satisfaction of the owner any damage to existing active improvements.
- D: Workmanship: To conform to all local, state and national codes and to be approved by all local and state agencies having jurisdiction.
- E. Trenching: Lay all pipe in open trenches, except when the local authority gives written permission for tunneling. Open the trench sufficiently ahead of pipe-laying to reveal any obstructions. The width of the trench shall be the inside pipe diameter plus 24 inches for 12 inches above the pipe. Sheet and brace trench as necessary to protect workmen and adjacent structures. All trenching to comply with Occupational Safety and Health Administration Standards. Keep trenches free from water while construction is in progress. Under no circumstances lay pipe or appurtenances in standing water. Conduct the discharge from trench dewatering to drains or natural drainage channels.
- F. Special Supports: Whenever, in the opinion of the Engineer, the soil at or below the pipe grade is unsuitable for supporting sewers and appurtenances specified in this section, such special support, in addition to those shown or specified, shall be provided as the Engineer may direct, and the contract
- G. Backfilling: For a depth of at least 12 inches above the top of the pipe, backfill with earth or granular material free from large stones, rock fragments, roots or sod. Tamp this backfill thoroughly, taking care not to disturb the pipe. For the remaining trench depth, backfill with earth or granular material containing stones or rocks not larger than 4 inches. Backfill under walks, parking areas, driveways and streets shall be granular material only - thoroughly compacted, by approved methods. Trenches parallel to and within 10 feet of paved roadways shall be constructed the
- H. Manhole Inverts: Construct manhole flow channels of concrete, sewer pipe or brick, smoothly finished and of semi-circular section conforming to the inside diameter of the connecting sewers. Make changes in size or grade gradually and changes in direction by true curves. Provide such channels for all connecting sewers at each manhole.
- I. Subdrains: All subdrains onsite shall be of the size as shown and shall be placed as shown on the plans. They shall be constructed to the grades shown. All drains constructed offsite as part of the outlet drain will be located as shown.
- J. Utilities: It shall be the responsibility of each contractor to verify all existing utilities and conditions pertaining to his phase of the work. It shall also be the contractors responsibility to contact the owners of the various utilities before work is started. The contractor shall notify in writing the owners or the engineer of any changes, errors or omissions found on these
- plans or in the field before work is started or resumed. K. Outfall Sewers: All drainage pipe and ditch outfalls to receiving streams or sewers shall be constructed in acordance with the drawings, subject however, to any modification required by the City of Carmel at the time installation is completed and to any adjustments needed for field conditions not adequately anticipated by the design drawings.

STREETS

Sidewalks and concrete slabs, exterior

SCOPE OF WORK

The work required under this section includes all concrete and bituminous paving and related items necessary to complete the work indicated on drawings and described in the specifications, including but not limited to: All streets, parking areas in contract limits

MATERIALS:

- A. Concrete: Concrete shall be ready-mixed of proportioned fine and coarse aggregates with Portland coment and water. Minimum cement content shall be 6 bat p cubic yard of concrete and maximum water content shall be 5.5 gallons per sack of cement. including moisture in the aggregate slum for normal weight concrete shall be a maximum of 4 inches and minimum of 2 inches. The slump of machine placed concrete shall be no ss than 1-1/4 inches nor more than 3 inches. Standard test ASTM C 43 shall be used to measure slump. Compressive strength of concrete at 25 yes shall be 4000 psi. All exterior concrete shall have air entrainment of 6% to 8% by volume per ASTM C-260. Retempering of delivered will not be allowed. Concrete shall be composed of:
- Portland cement: Conference to ASTM C-150, Type IA or Type IIIA.
- Aggregates: Conforming o ASTM C-33.
- Water: Shall be clear and ree from injurious amounts of oils, acids, alkalies, organic newsor or other deleterious substances.
- Welded Steel Wire Fabric: The required for concrete reinforcement shall conform to ASTM A185.

Curbs and gutters

- Premoulded Joint Filler: Shall be of non-extruding type meeting ASTM D-544, except that prinoulded joint filler used in concrete walk construction
- suding or resilient. D. Bituminous Paver Materials: All materials proposed for the construction of bituminous paven at shall comply with the Indiana Department of Highways Specification s, per latest revisions.
- Compacted Age are Subbase: Shall be crushed stone or gravel. Crushed gravel shall be limited gravel shall the minimum of 35% crushed material. Chert shall be limited to a maximum 6.8% of the total. Material shall be free from an excess of flat, clongated, trinly laminated, soft or disintegrated pieces; and shall be free from fragments coated with dirt. Compacted aggregate shall be graded as follows:

SIEVE SIZE	% PASSING
. 4	
1-1/2"	100
1"	80-100
3/4"	70-90
1/2"	55-80
#4	35-60
# 8	25-50
# 30	12-30
#200	5-10
	•

APPLICATION:

E. Placing Concrete

- A. Grading: Do any necessary grading in addition to that performed in accordance with Earthwork Section, to bring subgrades, after final compaction, to the required grades and sections for site improvement.
- B. Preparation of Subgrade: Remove spongy and otherwisk unsuitable material and replace with stable material. No traffic will be fallowed on prepared subgrade prior to paving.
- C. Compaction of Subgrade: The first 6 inches below the subgrade shall be compacted to at least 95% of the maximum dry density as determined by the provisions of AASHO T-99. Water shall be prevented from standing on the compacted subgrade
- D. Utility Structures: Check for correct elevation of all manhole covers, valve boxes and similar structures located within areas to be paved, and make, or have made, any necessary adjustments in such structur

1 Subgrade: Place concrete only on a moist, compacted subgrade or base free from loose material. Place no conditete on a muddy or

- frozen subgrade. 2. Forms: All forms shall be free from when the tenough to prevent leakage and substantial enough to maintain the r shape and position without springing or settling, when concrete is placed. Forms shall he clean and smooth immediately before con fer
- 3. Placing Concrete: Concrete shall consisted so as to require as little rehandling as practicable. Were concrete is to be placed at an atmospheric temperature of 35 degree. For less, paragraph 702.10 of the Indiana Department of Highways Specifications, latest revision shall be followed.

F Concrete Curb and Gutter:

- 1. Expansion Joints: Shall be 2 inc thick premoulded at ends of all returns and at a maximum specific of 100 feet.
- Contraction Joints: Unless of rwise provided, contraction joints shall be sawed joints spaced 20 feet on center.
- Finish: Tamp and s concrete as soon as placed, and fill any honey combed places. Finish square corners to 1/4" radius and other corners to radii show
- G. Concrete Walks and Exte
 - per foot cross slope. Make adjustments in slopes at walk here enons as necessary to provide proper drainage.
 - Dimensions: Walks and steps shall be one course construction and of widths and details shown on the drawings.
 - Finish: Screed concrete and trowel with a steel trowel to a hard dense su ace after surface water has disappeared. Apply medium broom freish and scribe control joints at 5 foot spacing. Provide 1/2" expans in the space of th Teet between expansion joints.
- H. Curing Contrete: Except as otherwise specified, cure all concrete by one of the method, legibled in Section 501.17 of the Indiana Department of lications, latest revisions.
- Bitumi s Pavement: Hot asphalt concrete pavement shall be a specified of the Indiana Department of Highway's Specifications, latest revisions. Paving will not be permitted during uhfavorable weather or when the temperature is 40 degrees F. and falling.
- J. Compacted Aggregate Subbase: The thickness shown on the drawings is the minimum thickness of the fully compacted subbase. Compaction shall be accomplished by rolling with a smooth wheeled rolle weighing 8 to 10 tons. Compact to 90% compaction using Standard Testing Procedures. Along curbs, headers and walls and at all placed not accessible to the roller, the aggregate material shall be tamped with mechagical tampers or with approved hand tampers.
- K. Construction within right-of-way: All street construction within the lines of dedicated right-of-way shall be in accordance with the Specifications of the City of Carmel.

WATER MAINS

- A. The work required under this section includes all cold water distribution lines, valves, meter pits, hydrants, and related items including excavating and backfilling necessary to complete the work shown on the drawings. The ends of water service lines shall be tightly plugged or capped at the terminal points pending the connecting to all such lines of the building piping as specified in the plumbing specifications and architectural
- MATERIALS:

SCOPE OF WORK:

- A. Cast Iron Pipe: Cast iron pipe shall meet AW Sp diffication C-106 with determined from Table 6.4 in AWWA C-106 pile iron pipe shall meet p to be ement lines per AWWA AWWA C-150 and C-151 Specifications.
- B. Copper Tubing: Shall be seamless, anneament tubing complying with Federal Specification WW-T-799. Fittings a be wrought copper or cast bronze with solder joints. Solder shall be o mposition recommended by the manufacturer of the fittings.
- C. Fire Hydrants: Shall comply with A VA pecification C-502 and shall meet local standards and requirement particularly as to nozzle diameters and threads, direction of opening and dimensions of operating and cap nuts. Fire Hydrants shall have one pumper a I two hose nozzles. A valve opening not less than 5 inches and 6 inc inlet connection. The length of the hydrant barrel shall be determined the specified depth of cover over the pipe.
- D. Valves: All valves and stops shall be provided for the proper install in the lines in which they are located. Valves shall meet local standards in the absence of such standards, the following requirements:
- Valves in cast iron piges be iron body, bronze mounted, disc gate valves conforming to A Specification C-500. They shall open in the same direction as the used in the local waterworks system. Valve stems shall terminate in 2 inch wrench nuts. Furnish two (2)
- Valves in copper pipe shall be standard brass body, round-way, ground-key stops with T heads. Furnish two (2) keys.
- E. Valve Boxes: Shall per local standards or in the absence of such, shall comply with the foll wing equirements:
 - For iron body s, boxes shall be approved standard buffalo-type, cast iron, a stable shaft boxes, having a minimum shaft diameter of 5-1/4 inches
 - 2. For brass body valves (stops) boxes shall be approved standard cast iron extension service boxes, having a minimum diameter of 2-1/2 inches and having lid held in place by a brass or bronze bolt. The castings shall be coated with two coats of coal-tar pitch varnish. Furnish two (2) keys for bolt in lids.
- F. Plastic Pipe: Shall conform to ASTM D-2241-SDR 26 with solvent weld joints conforming to ASTM D-2855.
- G. Stops: Stop shall be those manufactured by Ford or Mueller Corporation with AWWA taper thread, and with copper compression type fitting on outlet, or equal.
- H. Blow-off Valves: Blow-off valves shall be those manufactured by Mueller Corporation (H-10283 or H-10291), or equal.
- I. Angle Valves: Angle valves at the end of water service stub are to be copper compression type fitting also, and are to be protected with plastic bag over the valve.
- J. Taps: 3/4" taps in lines smaller than 4 inches shall be only by tapped tee or tapping saddle. Water service lines should be marked on curbs with blue paint: (Sewer lateral locations - red).
- APPLICATION:
- A. Permits and Codes: The intent of this section of the specifications is that the contractor's bid on the work covered herein shall be based upon the drawings and specifications but that the work shall comply with all applicable codes and regulations. Contractor shall furnish all necessary bonds to get permits for cuts and connections.
- B. Existing Improvements: Maintain in operating condition all active utilities

and sewers and other pipe system that may be encountered.

- C. Trenching: Lay all pipe in open trenches, except when local authority gives written permission for tunneling. Provide a separate trench for the water line at least 10 feet horizontally from any sanitary sewer. In locations where separate trenches for sewer and water lines are impracticable, lay the water pipe on a solid shelf at least 18 inches above the top of the sewer.
- D. Width of Trench: Excavate trenches 12 inches each side of the pipe for
- proper installation of pipe. E. Sheeting and bracing; Sheet and brace trenches as ssary to protect workmen and adjacent structures. All trenching shall comply with the
- Occupational Safety and Health Administration Standars F. Water Removal: Keep trenches free from water while construction therein is in progress. Under no circumstances la por appurtenances in standing water. Conduct the discharge from leach bewatering to drains or natural drainage channels.
- G. Grading Trench Bottoms: The bottom qua of the pipe shall be fully and uniformly supported. The full load shall red on the barrel of the pipe. The trench may be excavated to a dep t of sinches or more below final grade with sand, crushed stone or grad bac fill to bring it back to pipe laving grade. For a depth of at least 1 sees above the top of the pipe backfill with earth or granular material free from large stones, roots or frozen clogs. Tamp this backfill thorough, taking care not to disturb the pipe. Backfill under walks, parking a as driveways and streets with granular material only and take the oughly, by approved methods. Trenches parallel to and within 10 let of paved roadways shall be
- H. Tests: Before joints are covered, all the piping with water, opening hydrants or other outlets to speciair. Test the piping for leakage for a period of at least two hours pressure of 100 pounds per square inch. Inspect all joints for leakage and medy any leaks. Upon completion of the water distribution main flesh out the system until the water runs clear.

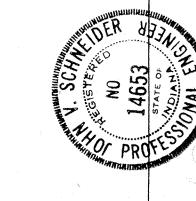
 As soon as the system has been flushed out, it shall be sterilized in accordance with the requirement of the Carmel Water Department.

Trenches parallel to and within

constructed the same.

Engineer for approval.

- Shop Drawings: Submit Shop Drawings of hydrants and valves to City
- J. If a horizontal distance of 10 feet cannot be maintained between the water line and the sanitation wer line, the sewer must be constructed of water works grade duetile ronge with mechanical joints within 10' of the water
- K. Utilities: It sha be the responsibility of each contractor to verify all existing utilities at a ditions pertaining to his phase of the work. It shall also be the conceptors responsibility to contact the owners of the various utilities before wos started. The contractor shall notify in writing the owners or the agineer of any changes, errors or omissions found on these plans or in the Ire. before work is started or resumed.
- L. New Water Main Construction: Contractor to record dimension of each water stub and valves from nearest fire hydrant measured along water main. The locations of hydrants and water valves, along with any other construction changes are to be incorporated on the original construction drawings and "Record Drawing" prints submitted to City Engineer's Office as soon after completion of construction as possible.



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