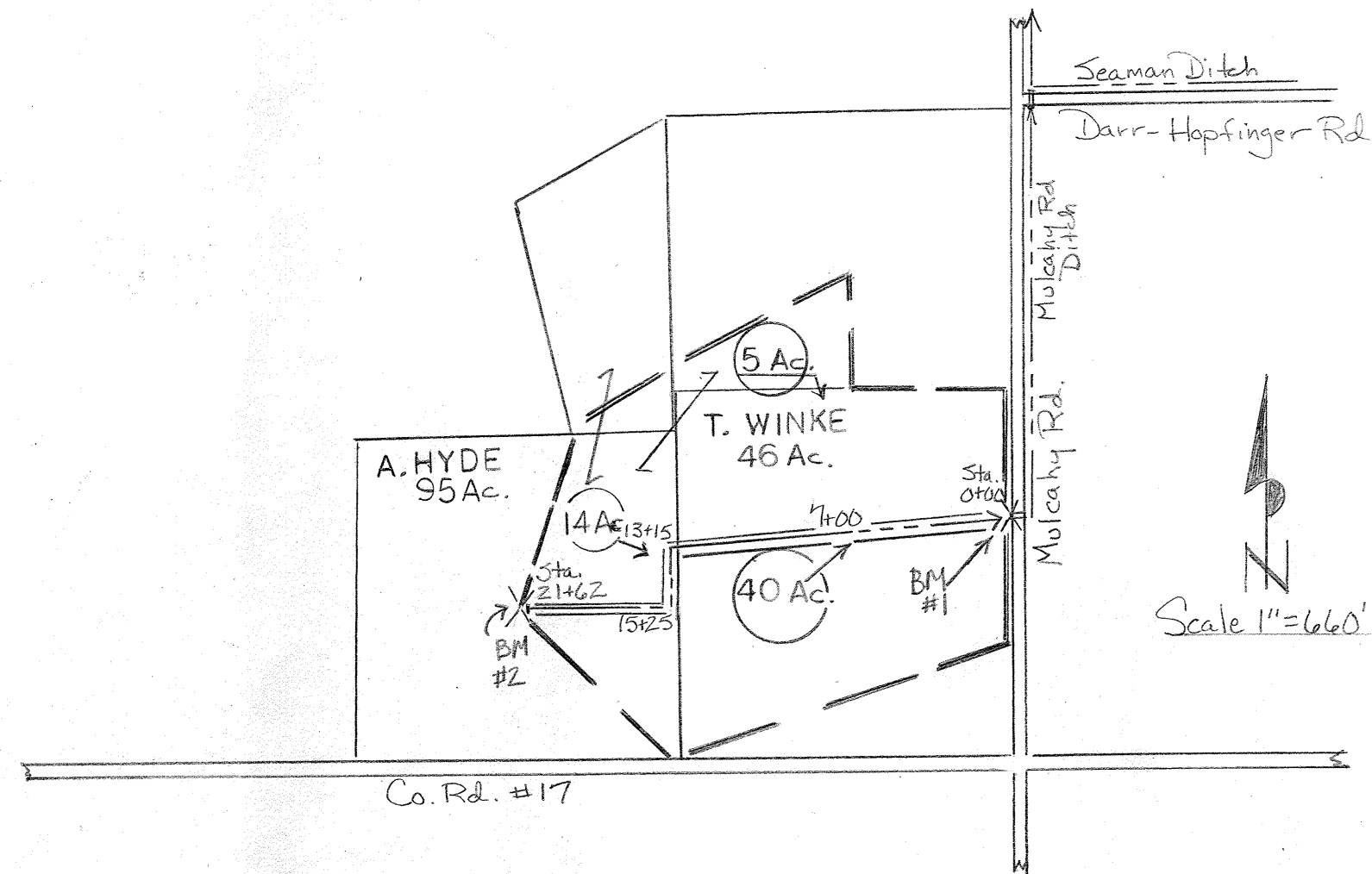
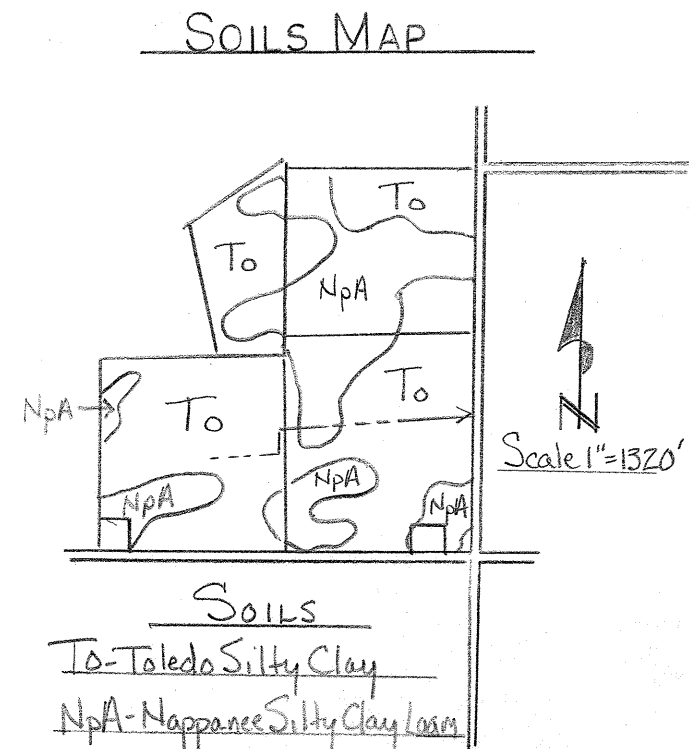


WATERSHED LOCATION MAP



- LEGEND**
- Ditch Reconstruction
 - Open Ditch
 - Property Line
 - Watershed Boundary
 - Acres Owned 46 Ac
 - Acres in Watershed 40 Ac
 - Benchmark

BENCHMARK	DESCRIPTIONS
B.M. #1 - top and center of west end of 24" R/C sewer on west side Mulcahy Road at Sta. 0+00 of Hopfinger Ditch East.	B.M. #2 - Top and center of west end of 10" R/C sewer for lane 15' west of Sta. 21+62 Hopfinger Ditch East.
MSL Elev. 576.00	MSL Elev. 576.73

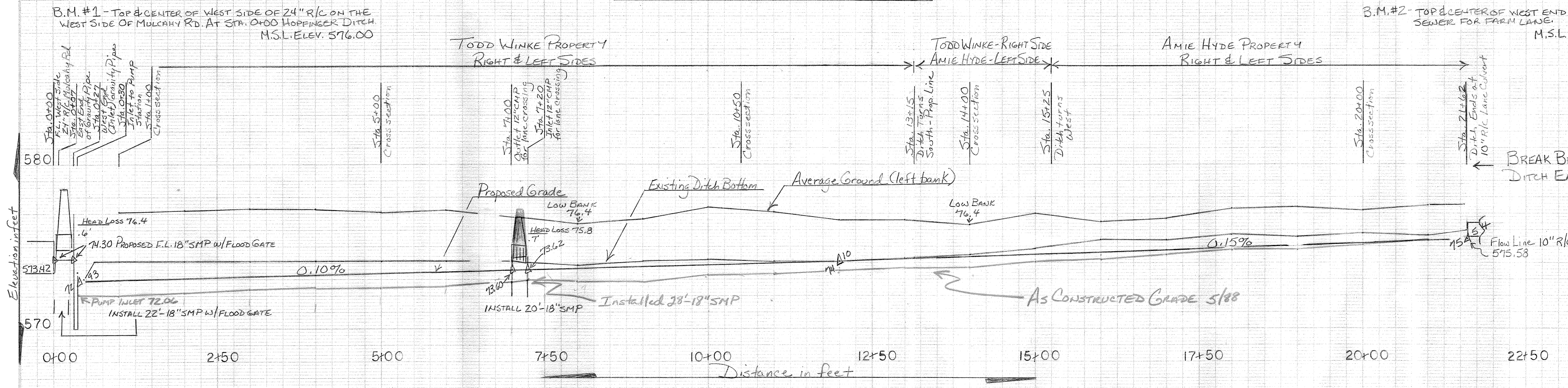
CONSTRUCTION INFORMATION AND SPECIFICATIONS

- Drainage Area: 59 acres (2 landowners)
- Design Coefficient: Qb Curve (4"/24 hrs. runoff)
- Watershed: Cropland - 59 acres, 0-2% slope, Toledo-Nappanee Soils, Surface Water Only
- Excavation: 4' bottom width, 2:1 side slopes
Sta. 0+30 - 12+00 - 0.10% grade
Sta. 12+00 - 21+62 - 0.15% grade
781 cubic yards on 2131 lineal feet
Spoil to be spread at the direction of the landowners.
- Clearing: All brush and debris which interferes with construction will be cleared at the time of excavation or prior to starting. All debris will be removed from ditch and required berm.
- Berms: A 6' berm will be left on both sides of the ditch to permit entrance for maintenance. The berm will start at the top of the ditch slope and extend 6' into the fields on either side. Where surface water enters the ditch in a defined channel, grass or an erosion control structure will be installed to prevent silt from entering.
- Seed and fertilizer: Area to be seeded 1.4 acres (approximately)
The following quantities should be used:
700# 10-10-10 fertilizer or equivalent (500#/ac.)
56# tall fescue (40#/ac.)
3 bushel wheat or rye (2 bu/ac) temporary seeding
Seeding to be done at end of each day of construction.
- Culverts: Sta. 0+30 install 22' of 18" smooth metal pipe to at the elevation shown on profile.
0+52
Sta. 7+00 install 20' of 18" smooth metal pipe to at the elevation shown on profile.
7+20
- Outlet: A screw type pump (capacity 1,200 gallons per minute) and an 18" smooth metal pipe with flapgate will be installed.

Notice to Landowners and Contractors

Preparation of a plan by the USDA - Soil Conservation Service does not include needed construction permits. Before construction begins, the landowner must obtain construction permits from the Ohio Dept. of Transportation, the Ottawa County Engineer, or applicable township trustees if any works is to be done on road right-of-ways.

PROFILE-HOPFINGER DITCH (EAST)



NOTICE TO LANDOWNERS AND CONTRACTORS
UNLESS OTHERWISE SPECIFICALLY SHOWN BY MEANS OF PROFILES AND ELEVATIONS, THIS CONSTRUCTION PLAN REPRESENTS ONLY SURFACE CONDITIONS AND PRACTICE LAYOUT REQUIREMENTS. NO REPRESENTATION IS MADE BY THE SOIL CONSERVATION SERVICE, USDA, AS TO THE EXISTENCE OR NONEXISTENCE OF UNMARKED UNDERGROUND PIPELINES, CABLES, OR OTHER UNDERGROUND HAZARDS.
PRIOR TO THE START OF CONSTRUCTION THE OWNERS OF PIPELINES OR OTHER UTILITIES MUST BE NOTIFIED OF THE PENDING CONSTRUCTION, GIVING THE DATE AND TIME OF THE START OF CONSTRUCTION. THE PROPERTY OWNER IS RESPONSIBLE FOR GIVING THIS NOTICE.

CONSTRUCTION CHECKED 5/20/88
AS BUILT ELEVATIONS IN RED. D.H.

APPROVED BY: *John A. Pascoe* 8/24/87
OTTAWA CO. ENGINEER

SURVEYED 8/12/87
X - EL 1 LASER
Φ - HARLAN
□ - DEWESSE

JOB CLASS II
OPEN DITCH RECONSTRUCTION
HOPFINGER GROUP (EAST DITCH) #171
BAY TWP. SEC. 8, OTTAWA CO.
U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Designed: Dave Harlan	Date: 8/87	Approved by: <i>J. Woodhead</i>	Title: AREA ENGINEER
Drawn: D. Harlan			8/20/87
Traced:			
Checked: Raw	8/87		

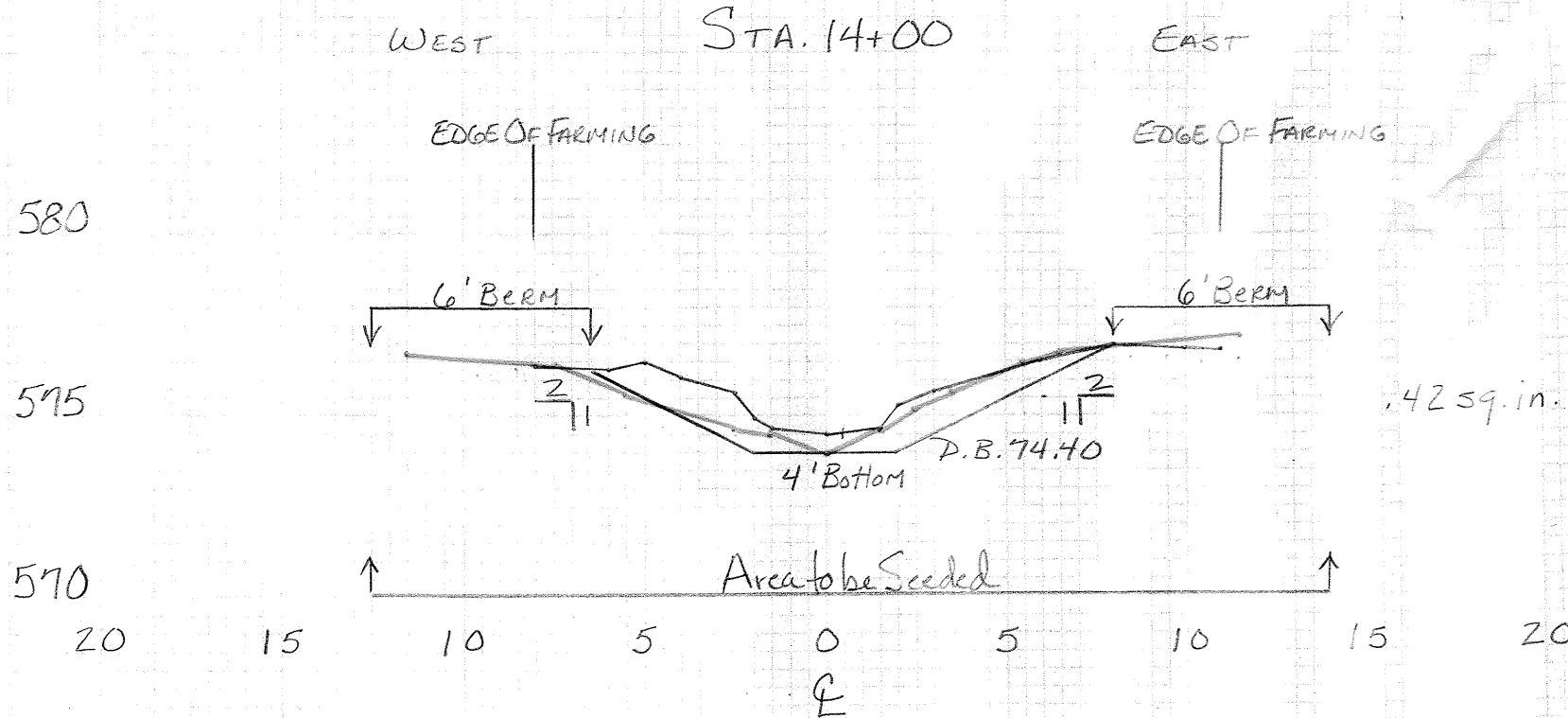
Title: _____
Sheet: No. 1 of 3
Drawing No.: 39-01-383-87-18

CROSS SECTIONS

As Constructed
Cross-Sections in Red
5/88 SMH.

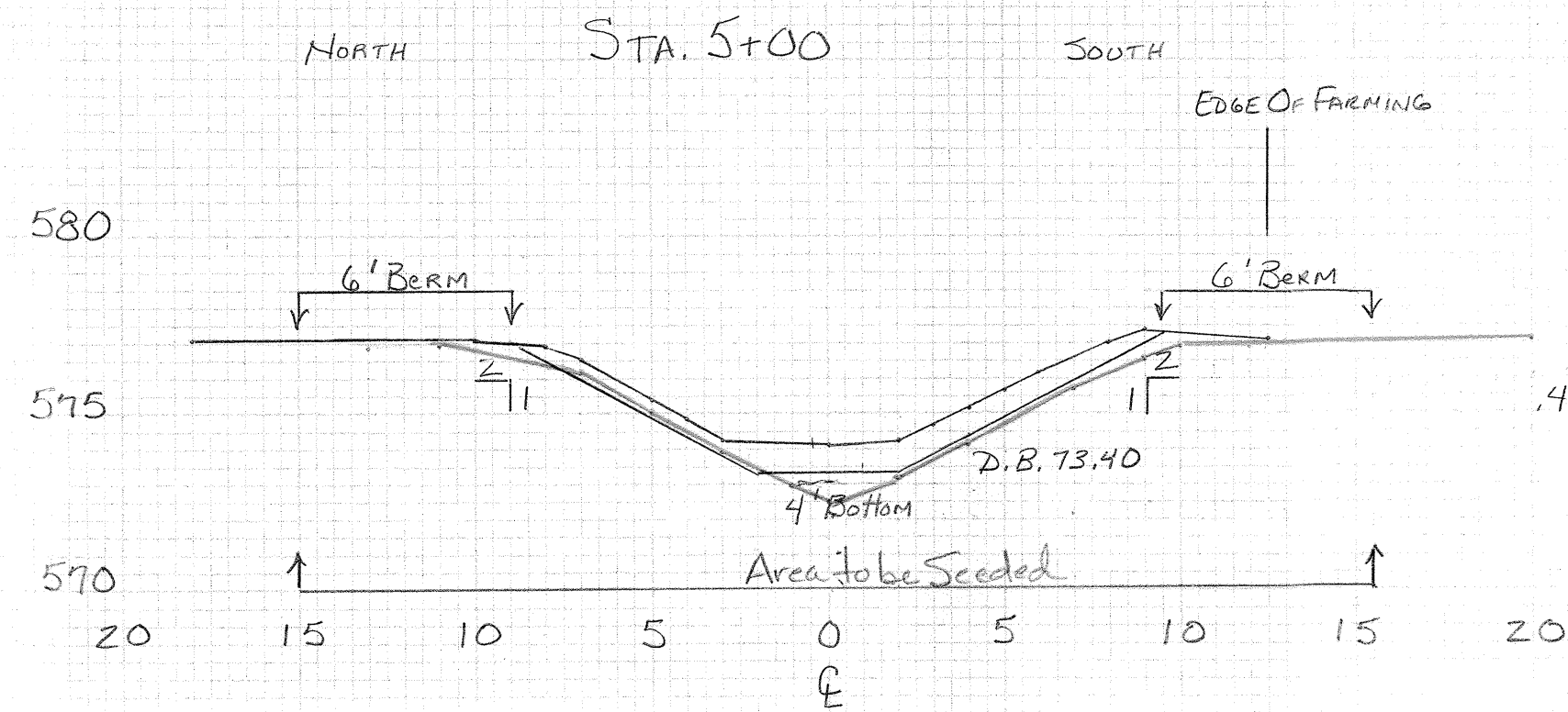


.75 sq. in.

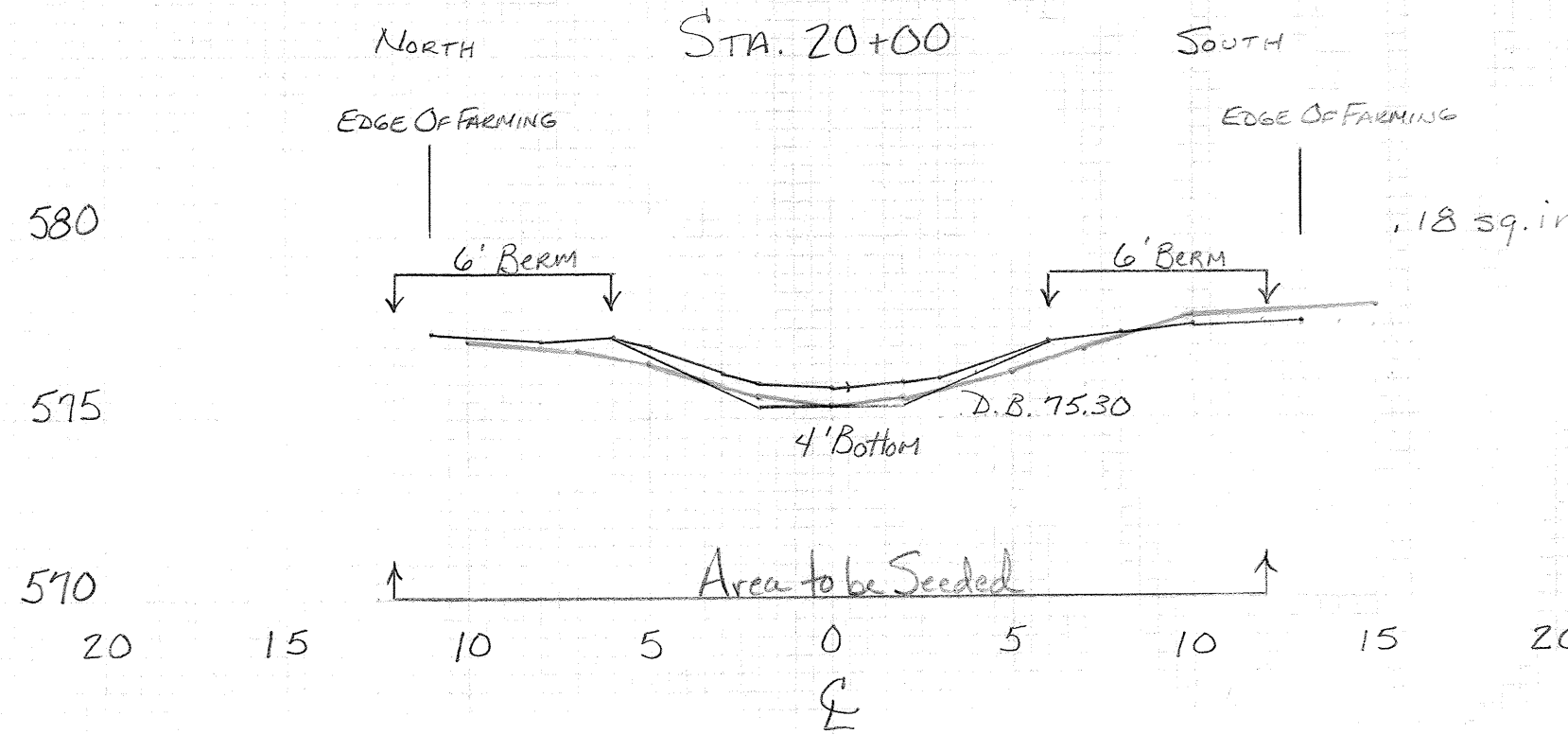


.42 sq. in.

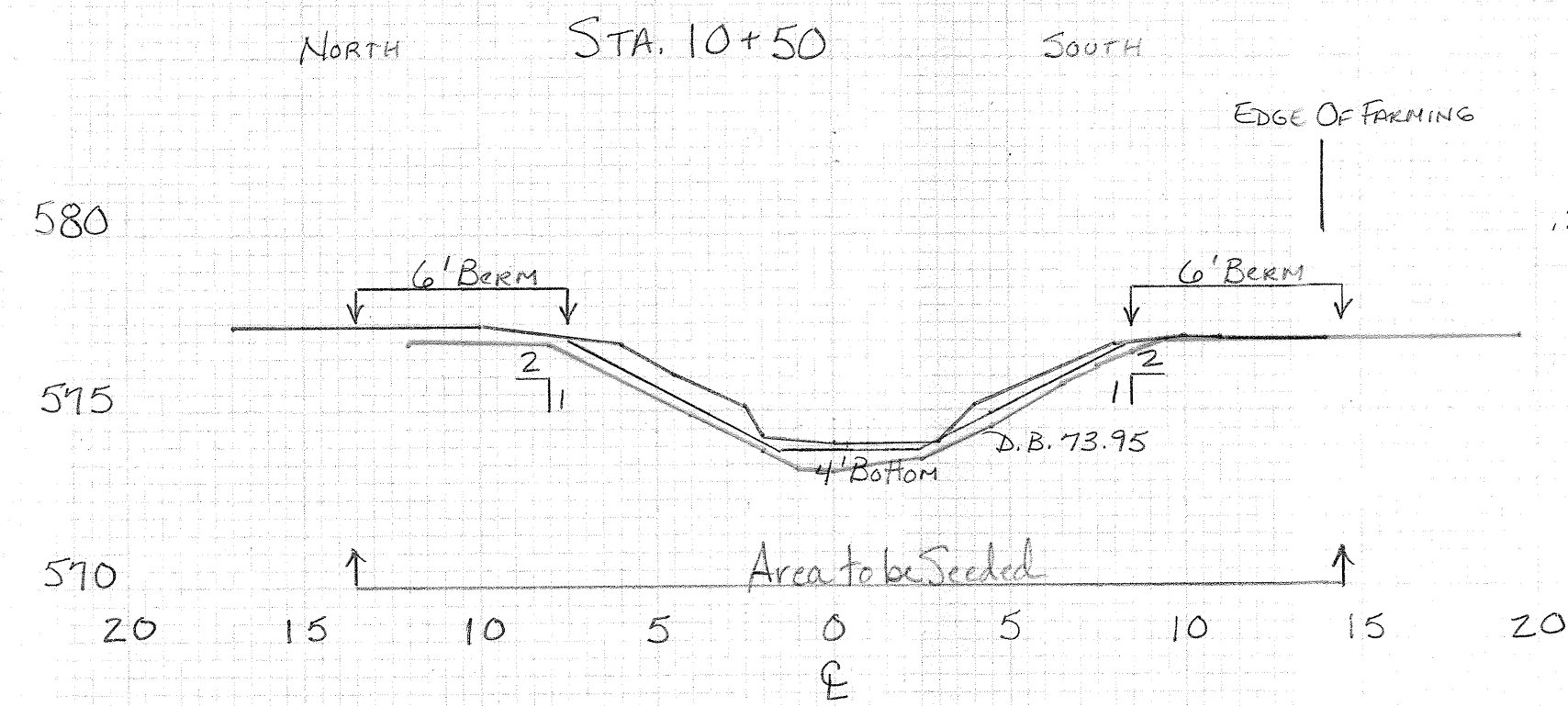
NOTE THIS X-SECTION TAKEN BETWEEN STATIONS 15+00 & 16+00.



.47 sq. in.



.18 sq. in.



.25 sq. in.

YARDAGE CALCULATIONS

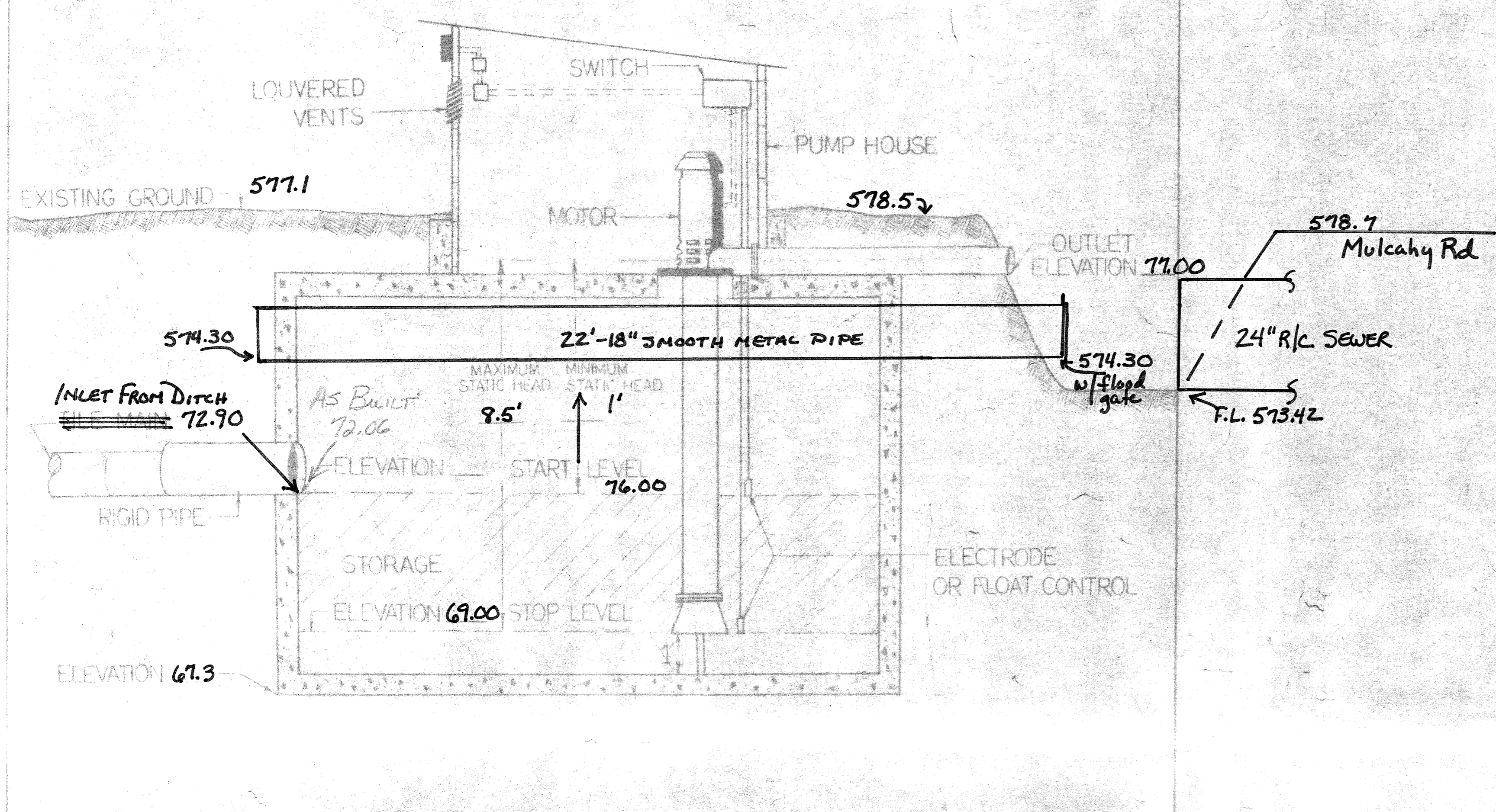
Station	Square Inch	Au. Sq. In.	Yardage	Distance	Total
0+30 - 1+00	.75 in ²	.61	.57	470'	268
5+00	.47 in ²	.36	.34	550'	187
10+50	.25 in ²	.34	.32	350'	112
14+00	.42 in ²	.30	.28	762'	214
20+00	.18 in ²				78/yd ³
21+62					

JOB CLASS II

OPEN DITCH RECONSTRUCTION
HOPFINGER GROUP (EAST DITCH) #171
BAY TWP. SEC. 8, OTTAWA CO.

U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

Dave Harlan 2/87
D. Harlan 2/87
RW 4/87 2/3 39-01-383-87-18



HYDRAULIC DATA

PUMP

DRAINAGE AREA --- TILE WATER ONLY --- ACRES
 SURFACE WATER ONLY 59 ACRES
 DRAINAGE DESIGN COEFFICIENT 1 INCH PER 24 HRS
 THE CAPACITY OF THE PUMP SHALL BE DETERMINED BY USING THE FOLLOWING FORMULA:
 $Q = C \times A \times 0.042 \times 450 \times F$
 Q = CAPACITY IN GALLONS PER MINUTE
 C = DRAINAGE COEFFICIENT
 A = WATERSHED AREA IN ACRES
 0.042 = FACTOR TO CHANGE 1 INCH IN 24 HRS. TO CUBIC FEET PER SECOND PER ACRE
 450 = FACTOR TO CHANGE CUBIC FEET PER SECOND TO GALLONS PER MINUTE
 F = 1.2 FOR SUBSURFACE DRAINAGE ONLY
 1.0 FOR SURFACE DRAINAGE OR SURFACE DRAINAGE PLUS SUBSURFACE DRAINAGE
 Q = 1,115 gpm for 1" / 24 hrs.

SUMP SIZE

BASED ON PUMP CAPACITY OF _____ GPM DURING CYCLING
 AND A STORAGE DEPTH (D) OF _____ FT.
 CROSS-SECTIONAL AREA OF SUMP REQUIRED = $\frac{GPM}{D}$ = _____ SQ. FT.
 FOR A MAXIMUM CYCLING OF 8 TIMES PER HOUR
 SIZE OF SUMP Storage in ditch 44,090 ft³ or 330,675 gallons at 576. elevation water level

STATIC HEAD DATA

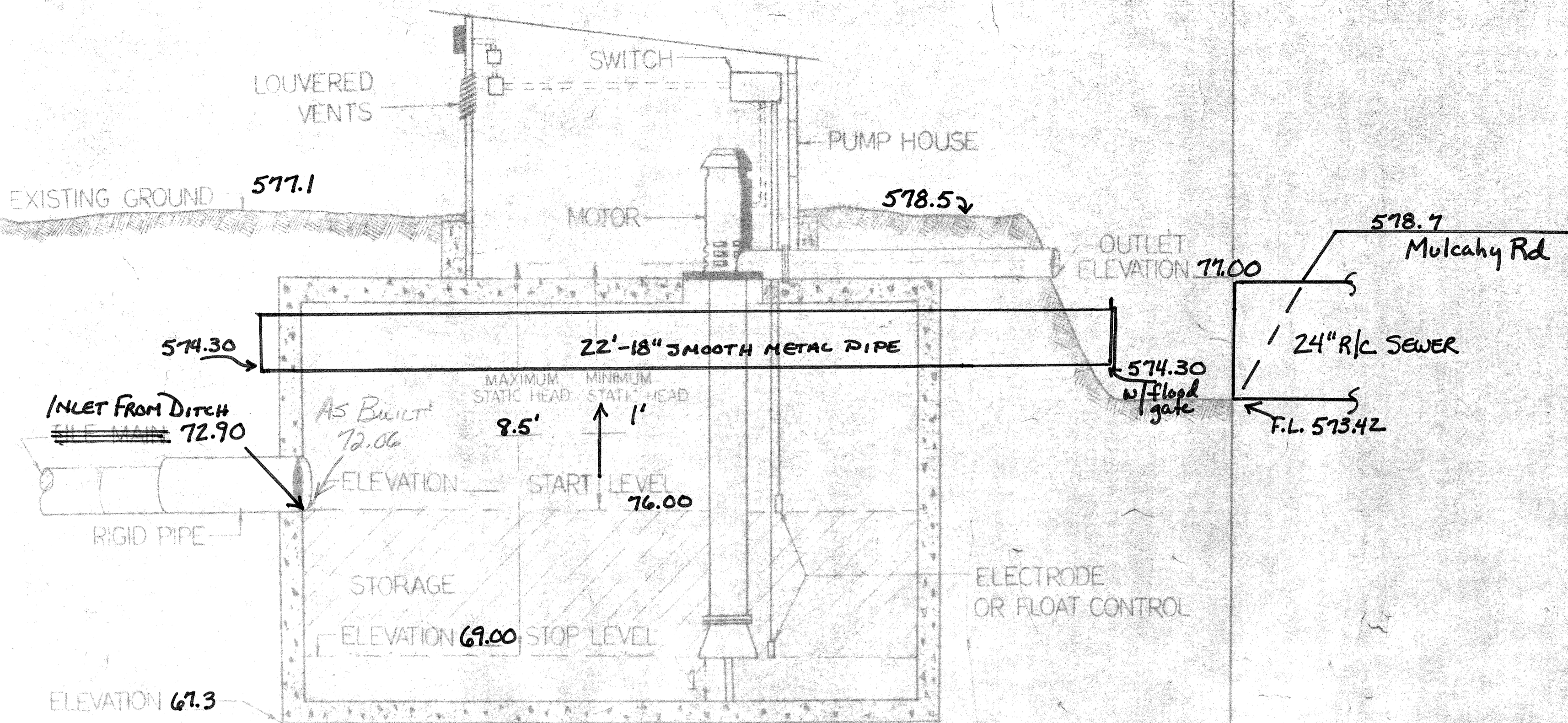
MAXIMUM STATIC HEAD ----- 8.5'
 MINIMUM STATIC HEAD ----- 1.0'
 STATIC HEAD DURING CYCLING --- 4.75'

10" screw type pump w/ 7 1/2 hp motor rated @ 1,200 gpm w/ 8' lift.
 Pump capacity 2.7 cfs
 18" SMP capacity 7.3 cfs (.6' head loss)
 10.0 cfs

JOB CLASS II

AUTOMATIC PUMPING STATION
 HOPFINGER GROUP (EAST DITCH) #171
 BAY TWP. SEC 8, OTTAWA Co.
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

DESIGNED Dave Harlan 8/87
 DRAWN D. Harlan 8/87
 RLW 8/87



HYDRAULIC DATA

PUMP

DRAINAGE AREA --- TILE WATER ONLY --- ACRES
 SURFACE SURFACE WATER ONLY 59 ACRES
 DRAINAGE DESIGN COEFFICIENT 1 INCH PER 24 HRS
 THE CAPACITY OF THE PUMP SHALL BE DETERMINED BY USING THE FOLLOWING FORMULA:
 $Q = C \times A \times 0.042 \times 450 \times F$
 Q = CAPACITY IN GALLONS PER MINUTE
 C = DRAINAGE COEFFICIENT
 A = WATERSHED AREA IN ACRES
 0.042 = FACTOR TO CHANGE 1 INCH IN 24 HRS. TO CUBIC FEET PER SECOND PER ACRE
 450 = FACTOR TO CHANGE CUBIC FEET PER SECOND TO GALLONS PER MINUTE
 F = 1.2 FOR SUBSURFACE DRAINAGE ONLY
 1.0 FOR SURFACE DRAINAGE OR SURFACE DRAINAGE PLUS SUBSURFACE DRAINAGE
 $Q = 1,115 \text{ gpm for } 1''/24 \text{ hrs.}$

SUMP SIZE

BASED ON PUMP CAPACITY OF _____ GPM DURING CYCLING
 AND A STORAGE DEPTH (D) OF _____ FT.
 CROSS-SECTIONAL AREA OF SUMP REQUIRED = $\frac{Q \times D}{8}$ SQ. FT.
 FOR A MAXIMUM CYCLING OF 8 TIMES PER HOUR
 SIZE OF SUMP Storage in ditch 44,090 ft³ or 330,675 gallons at 576. elevation water level

STATIC HEAD DATA

MAXIMUM STATIC HEAD ----- 8.5'
 MINIMUM STATIC HEAD ----- 1.0'
 STATIC HEAD DURING CYCLING --- 4.75'

10" screw type pump w/ 7 1/2 hp motor rated @ 1,200 gpm w/ 8' lift.

Pump capacity 2.7 cfs
 18" SMP capacity 7.3 cfs (.6' head loss)
 10.0 cfs

JOB CLASS II

AUTOMATIC PUMPING STATION
 HOPFINGER GROUP (EAST DITCH) #171
 BAY TWP. SEC 8, OTTAWA Co.
 U.S. DEPARTMENT OF AGRICULTURE
 SOIL CONSERVATION SERVICE

DAVE HARLAN 8/87
 D. HARLAN 8/87
 RLW 8/87