

Little Tobacco Intercounty Drain Clare and Isabella County, Michigan

Open Channel Project Location

The project is primarily located in the southeast quadrant of Grant Township (T.17N.-R.4.W) in South Central Clare County and the northeast quadrant of Vernon Township (T.16N.-R.4.W) in north central Isabella County, Michigan, commencing in the Tobacco River approximately 7 rods east and 13 rods north of the interior corner of Section 36, Grant Township, Southeast of the City of Clare Sewage Treatment Plant, thence extending westerly in a meandering manner crossing west bound and east bound US 10, thence continuing westerly crossing Eberhart Rd. and the boundary between Section 36 and 35, thence continuing westerly crossing northbound US 127 and southbound US 127, thence westerly crossing the N-S ¼ line of Section 35 approximately 4.5 rods north of the E-W ¼ line, thence southwesterly crossing Sixth St., Fifth St. west of Jefferson St., Fourth St. east of Hemlock St., Third St. east of Pine St., Second St., Rail to Trail and Great Lakes Central Railroad east of Pine St., thence continuing westerly crossing McEwan St. and the boundary between Section 35 and 34 approximately 16 rods north of the south County Line, thence westerly crossing Maple St. north of Second St., thence continuing northwesterly to the east side of the Great Lakes Central/MDOT Railroad, thence southwesterly along the easterly side of the railroad to Dunlop Rd. being the County Line and boundary between Section 35 of Grant Township and Section 3 of Vernon Township, thence continuing as the Duncan Drain southwesterly approximately 37 rods crossing the railroad, thence continuing southwesterly to Herrick Rd. and boundary between Section 3 and 10 of Vernon Township, thence continuing southerly to the upper terminus of the project on the south side of Herrick Rd, approximately 68.5 rods west of the Great Lakes Central Railroad.

DESCRIPTION OF RECOMMENDED WORK

A summary of the recommended work to be performed under this project consists of the following:

1. Clearing the entire open drain proper and all permanent and temporary easement areas within 50 feet of the Channel Centerline where spoil will be placed and spread. Generally the drain proper includes the channel bottom, bank slopes, and the area adjacent to the drain within 5 foot of the top of the slope. Selectively clearing sensitive areas where spoil may not be spread including some wetlands, nature areas and lawns by clearing brush and only trees that are dead, dying or leaning or that interfere with channel flow or construction activities within the drain easement. Sensitive areas include the reach from the channel outlet upstream to the downstream side of westbound US 10, (original Sta. 32+36.7), the nature trail reach from the upstream side of south bound US 127 (Sta. 58+73.4) to the nature trail footbridge (Sta. 70+50), the residential reach from the private footbridge (Sta. 92+00) upstream to Second St. (Sta. 116+67.8), and the reach from the Kabota Dealership (Sta. 120+00) upstream to Sta. 144+00 south of Second St. on the east side of Great Lakes Central Railroad. All areas within the drain proper shall be grubbed where excavation takes place. Undisturbed bank slopes do not require grubbing. Additionally in non-wetland tillable areas the tree stumps and brush roots shall be grubbed within the spoil disposal areas. Stumps not scheduled for grubbing shall be sprayed with an approved herbicide. Clearing and grubbing operations shall be done and material properly disposed of before excavated channel material is placed on the easement. **All cleared timber belongs to the Landowner and should not be removed from the site unless permission is obtained from the Landowner.** Cleared trees and

brush from the channel outlet upstream 172 rods to the downstream side of west bound US 10 (original Sta. 32+67) shall be placed such that they will not enter the drain during times of out of bank flooding. Cleared trees and brush from original Sta. 32+36.7 to the upstream side of US 127 southbound (original Sta. 58+73.4) may be chipped and placed at the outside edge of the drain easement or removed from the site. Cleared trees and dead vegetation within the nature area (Sta. 58+73.4 to 70+50) must be removed from the site. Special care shall be taken not to disturb this area any more than necessary. Cleared trees and brush upstream from Sta. 70+50 to 144+00 must be removed from the site unless the landowner requests that timber be left onsite.

2. Construction of five each sediment basins constructing a 2 ft. high temporary rock dam and over excavating two hundred feet of the channel an additional one ft. along the lower end of the channel, and upstream of eastbound US 10, Nature Area Footbridge (Sta. 70+50), Third St. (Sta. 112+00) and upstream from Great Lakes Central Railroad (Sta. 160+50). Accumulated sediments during construction shall be removed periodically from each sediment sump and upon project completion. The temporary rock dams shall be removed after vegetation has been established on the channel banks.
3. Channel Excavation:
 - a. Removal of wood debris, minor silt bars, and channel flow obstructions along 162.7 rods of meandering channel maintaining the natural channel aesthetics, 9.3 rods of new channel reconstruction with 14 ft. bottom width, and 2 on 1 side slopes with spoil placed in upstream ends of existing relocated channel, and cleanout 4 rods of outlet channel for the Gilmore County Tile Drain for a total of 176 rods downstream from westbound US 10, and removal of wood debris, minor silt bars, channel flow obstructions, and channel bank repairs between westbound and eastbound US 10 (23.6 rods) and between northbound and southbound US 127 (9.2 rods) basically matching typical existing channel cross sectional configuration. Spoil may be placed along drain within drain easement on MDOT property.
 - b. Cleanout of 48.2 rods of existing channel and reconstruction of 39.7 rods of new channel for a total of 87.9 rods between eastbound US 10 and northbound US 127 with 14 ft. bottom width, 3 ft. wide benches and 2 on 1 side slopes with spoil placed in upstream ends of relocated existing channel.
 - c. Removal of wood debris, silt bars and channel flow obstructions typically matching existing channel cross sectional configuration with 16 ft. bottom width maintaining the natural channel aesthetics including preservation of the island (Sta. 62+00 to 65+00) along 71.3 rods of meandering channel through the nature area upstream from southbound US 127 to the nature area foot bridge (Sta. 70+50). From Sta. 66+50 to 70+75 sediment removal is more significant, therefore benches should be incorporated into the constructed cross sectional configuration. All excavated spoil must be removed from the site.
 - d. Excavation of approximately 162.1 rods of open channel with 16 ft. wide bottom and 3 ft. wide benches on each side with 2 on 1 side slopes commencing at the nature area foot bridge (Sta. 70+50) extending to sta. 97+25 (97+00-97+50

- bottom width transition) and from sta. 97+25 through the city of Clare to Maple St. (Sta. 136+50.3) 237.9 rods of open channel with 14 ft. wide bottom and 3 ft. wide benches on each side with 2 on 1 side slopes. Excavated spoil must be removed from the site in all wetlands areas and most lawn areas.
- e. Excavation of approximately 92.2 rods of open channel with 12 ft. wide bottom and 3 ft. wide benches on each side with 2 on 1 or flatter side slopes commencing at Maple St. (Sta. 136+50.3) upstream to Dunlop Rd. (Sta. 151+70.9) Excavated spoil must be removed from the site in all wetland areas and most lawn areas.
 - f. Excavation of approximately 38.3 rods of open channel with 10 ft. wide bottom and 2 ft. wide benches on each side with 2 on 1 or flatter side slopes commencing at Dunlop Rd. (Sta. 151+70.9) upstream to the Great Lakes Central Railroad Crossing (Sta. 158+02.5). This is a wetland and spoil must be removed from the site.
 - g. Excavation of approximately 412.6 rods of open channel with 8 ft. wide bottom and 2 ft. wide benches on each side with 2 on 1 or flatter side slopes commencing at the Great Lakes Central Railroad crossing (Sta. 158+02.5) upstream to Herrick Rd. (Sta. 226+11). Approximately 60 percent of this reach has wetlands on both sides of the channel. Spoil can't be deposited in wetland areas.
4. Demolish and remove the office building at 314 E. Fifth St. at the southwest corner of Fifth St. and Jefferson St. including the concrete retaining wall and chain link fence
 5. Furnish and install 864 sq. ft. or 72 lineal ft. (4'x64'x4', 12' deep) of Z65 series sheet piling with cap between Sta. 141+12.4 and 141+84.4 on the left side to protect a pole barn structure.
 6. Furnish and install MDOT precast concrete pipe outlet headwalls:
 - a. 1 each - 36 in. dia. pipe Sta.: 140+90 RT
 - b. 1 each 30 in. dia. pipe Sta. 130+35.3 RT (incl. 41 ft. of 30 in. dia. RCP)
 - c. 1 each - 24 in. dia. pipe Sta.: 140+00 RT
 - d. 4 each - 18 in. dia. pipe Sta.: 85+50 RT, 96+60 RT, 130+47 RT (incl. 41 ft. of 18 in. dia. RCP) 138+72 RT
 - e. 1 each - 12 in. dia. pipe Sta.: 138+19 incl. one 2 ft. dia. CB and 8.2 ft. of 12 in. dia. RCP
 - f. 1 each - 8 in. dia. pipe Sta.:138+53 RT
 7. Remove existing bridge railings including concrete posts at Sixth St. and Maple St. and install new metal railings and posts or reconstruct concrete posts.
 8. Repair spauling, cracks and other concrete surface degradation on the substructure and superstructure of existing bridges at Sixth, Fifth, Fourth and Maple St. Also remove old concrete chutes at northeast and southeast quadrant of Sixth St. bridge and extend existing 14 in. dia. PVC pipe approximately 16 ft. The asphalt road surface and approaches at the Fourth St. bridge should receive an HMA cap.

9. Extend existing 24 in. dia. ADS. N-12 storm sewer south to Little Tobacco Drain by installing 62 lin. ft. of 24 in. dia. non-perforated ADS N-12 pipe including a 24 in. dia. tee/riser with MDOT "G" cover at Station 140+00 RT west of the water treatment facility. After pipe is properly bedded excavated spoil may be placed over pipe and adjacent city property including filling in the existing outlet channel.
10. East bound US 10: replace the 102 ft. long 10 ft. x 8 ft. poured in place concrete box culvert with a new box culvert (preliminary size: 102 ft.-14 ft. x 9 ft.) at the new design grade elevation. This work to be done by MDOT in 2018.
11. Eberhart Rd (C//L Original Sta. 51+17.1, new Sta. 52+09.7) remove and salvage existing 37.1 ft.-72 in. dia. CSP and 36.4 ft. 60 in. dia. CSP and furnish and install 66 ft. -14 ft. x 9 ft. concrete box culvert buried one foot with 10 ft. wingwalls and one ft. headwall on each end, including asphalt removal and replacement and heavy rock riprap at each end.
12. Third St. (Sta. 113+03.8) removal and disposal of the existing steel frame bridge with concrete abutments.
13. a) Second St. (Sta. 116+67.8): removal and disposal of the wood deck bridge with concrete abutments, b) Rail to Trail footbridge (Sta. 117+03.5): remove and salvage the entire superstructure deck including glu-Lam beams, 5/4x6 in. decking, board walk railing and posts etc. and removal and disposal of the upper 27-28 inches of each abutment, c) Great Lakes Central Railroad (Sta. 117+46.5): removal and disposal of 1913 reinforced concrete bridge and temporary removal and salvage of ballast, and ties that are in good condition. Replacement of aforementioned three bridges with one continuous 124 ft.- 16 ft. x 10 ft. concrete box culvert (80 ft.-H20 load design, 44 ft.-H80 load) buried one foot with 10 ft. wingwalls and 1.0 ft. high downstream headwall and 3 ft. 4 in. high upstream headwall, including asphalt removal and replacement on Second St., constructing new 10 ft. wide HMA bicycle path with 12 ft. wide aggregate base, and installing ballast, per railroad agreement. Railroad requires supplemental insurances and fees for flagmen, reinstalling ties and rail removal and reinstallation.
14. McEwan St. (Sta. 124+67.5) replace the 100 ft. twin cell 8 ft. x 7 ft. poured in place concrete box culvert with a 100 ft.-18 ft. x 10 ft. concrete box culvert buried one foot with 10 ft. wingwalls and 1.0 ft. high headwalls and metal pedestrian railings including asphalt and sidewalk replacement and heavy rock riprap or other acceptable material such as Contec Armor Flex at each end. A 2 1/2-3 in. dia. steel pipe, and an 8 inch diameter watermain extending through the existing culvert must be relocated.
15. Dunlop Rd. (Sta. 151+70.9) removal and disposal of the reinforced concrete bridge deck, guardrail and asphalt and easterly abutment and wingwalls and furnish and install 136 lineal ft. of 13'-8"x8'-9" polymer coated CSPA with beveled inlet buried six inches including asphalt removal and replacement and heavy rock riprap at each end. Supplemental insurances and fees for flagmen may be required by the railroad for work within their right of way.

16. Herrick Rd (Sta. 226+11): Removal of the two bay 12 ft. x 6 ft. wood bridge and furnish and install 80 lin. ft. of 13'-8"x8'-9" polymer coated CSPA with beveled inlet buried six inches including resurfacing paved road surface and heavy riprap at each end.
17. Sanitary Sewer Relocation
 - a) Manhole #4 to Manhole #5, Eastwood Drive – Install a small pump station and directional drill a force main under drain and connect to the existing 24 in. diameter sanitary sewer main.
 - b) Manhole #1 to Manhole #7 North of Whites Nursery Subdivision – Relocate sanitary sewer with siphon.
 - c) Manhole #11 to Manhole #12 North of Cleveland St. R.O.W. – Relocate sanitary sewer with siphon.
 - d) Manhole #14 to Manhole #14B, Sixth St. – Relocate sanitary sewer with siphon.
 - e) Manhole #16 to Manhole #16B, Fifth St. – Relocate sanitary sewer with siphon.
 - f) Abandon existing house sewer lead on north side of Fourth St. and install a residential grinder pump.
18. Watermain Relocation
 - a) Westside of Maple St. North of Second St. – Relocate 12 in. diameter watermain.
 - b) McEwan St., Northbound Lane – Relocate/replace 8 in. diameter watermain.
 - c) Pine St. south of GLC Railroad – Relocate 12 in. diameter watermain (wet site)
 - d) Second St. north of GLC Railroad – Relocate 12 in. diameter watermain.
 - e) Fourth St., west bound lane – Relocate/replace suspended 10 in. diameter watermain.
 - f) Fifth St. North side at Jefferson – Relocate/replace 8 in. diameter watermain.
 - g) Sixth St. north side – Relocate/replace 8 in. diameter watermain.
19. Furnish and install approximately 240 lineal ft. of polymer coated 15 inch diameter and 120 lineal ft. of 18 in. diameter corrugated steel pipe (CSP), 16 gage, standard corrugation to serve as open channel side inlet erosion control structures (ECS) all with steel flared end sections. Plain rock riprap shall be placed at the outlet of each structure except for those that outlet into a road culvert.
20. Furnish and install an estimated two 10 inch, two 8 inch and four 6 inch diameter polymer coated corrugated steel (CSP) tile outlets each 16 ft. long with approved galvanized removable steel pin rodent guards.
21. Furnish and install 660 lineal feet of heavy rock riprap bank slope protection including subsurface filter fabric at curve locations shown on the plans and an additional potential 4000 lineal feet where the toe of the bank slope is unstable as determined in the field by the engineer.

22. Construct nine cross vanes requiring approximately 8 cubic yards of plain and heavy riprap each and seventeen riprap single vanes requiring approximately 4 cubic yards each at locations shown on the plans and determined in the field by the engineer.
23. Construct stone faced retaining walls using Redi-Rock at the following locations:
- a) Sta. 97+70 – 99+30 RT Bank north of Sixth St., 160 lineal ft. by 4.5 high, buried one foot (4.5' x 160') 720 sq. ft.
 - b) Sta. 101+56.8 – 102+33.5 RT bank north of Fifth St., 76.7 lineal ft. by 4.5 ft. high, buried one ft. (4.5'x76.7') 345.2 sq. ft.
 - c) Sta. 101+93 – 102+83 LT Bank north of Fifth St., 90 lineal ft. by 4.5 ft. high, buried on foot (4.5'x90') 405 sq. ft.
 - d) Sta. 103+70 – 105+20 RT Bank south of Fifth St., 150 lineal ft. by 4.5 ft. high, buried one foot (4.5' x 150') 675 sq. ft.
 - e) Sta. 103+70 – 104+03.3 LT Bank south of Fifth St., 33.3 total lineal ft. (3.0'x 6.7' + 10.5' x 13.3' + 7.5' x 6.7' +4.5' x 6.7') 240.2 sq. ft.
 - f) Sta. 123+21 to 124+10.9 LT bank, east of McEwan St. 89.91 lineal ft. by 10.5 ft. high buried one foot (10.5' x 89.9') 944.1 sq. ft.
 - g) Sta. 123+21 to 124+10.9 RT bank 89.9 lineal ft. by 4.5 ft. high (4.5 x 89.9) 404.6 sq. ft.

Total 3734.1 sq. ft.

24. Construct bank slope toe protection using Contec ArmorFlex open cell cabled concrete erosion control revetment mats or equal at the base of Redi-Rock retaining walls at the following locations:
- a) Sta. 97+67.8 – 99+36.3 RT bank, 168.5 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 1516.5 sq. ft.
 - b) Sta. 101+50.6 – 102+40 RT bank, 89.7 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 807.3 sq. ft.
 - c) Sta. 101+86.9 – 102+85.2 LT bank, 98.3 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 884.7 sq. ft.
 - d) Sta. 103+67.7 – 105+26.5 RT bank, 158.8 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 1429.2 sq. ft.
 - e) Sta. 103+67.8 – 104+10 LT bank, 42.2 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 379.8 sq. ft.
 - f) Sta. 123+148 – 124+13.1 RT bank, 98.3 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 884.7 sq. ft.
 - g) Sta. 123+148 – 124+13.1 LT bank, 98.3 lineal ft. by 9 ft. wide including 1.6 ft. buried at bottom and 2.2 ft. buried at upstream & downstream ends 884.7 sq. ft.

Total 6786.9 sq. ft.

25. Construct bridge footing protection using Contec Armor Flex revetment mats or field poured concrete at the following locations:
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| a) | Sta. 99+61 Sixth St. Bridge 13.3 ft. span x 36.2 ft. long | 883 sq. ft. |
| b) | Sta. 103+24.7 Fifth St. Bridge 15.6 ft. span x 74.6 ft. long | 2143 sq. ft. |
| c) | Sta. 107+12 Fourth St. Bridge 20 ft. span x 62.6 ft. long | 1588 sq. ft. |
| d) | Sta. 136+50.3 Maple St. Bridge 16.3 ft. span x 46.6 ft. long | 1429 sq. ft. |
| e) | Sta. 158+02.5 GLC Railroad Bridge 10 ft. span x 26.7 ft. long | 1044 sq. ft. |
| | Total | 7087 sq. ft. |
26. Fabricate and install two each 6 ft. wide by 48 ft. long metal fabricated arched foot bridges with railings, treated lumber decks at Station 83+00 and 92+00 including steel pile abutments and approach ramps.
27. Install steel pilings or three sided concrete box culvert to serve as abutments for the covered farm bridge at Station 158+91.9 including reconstruction of approach ramps and landscaping.
28. Restoration of all disturbed areas including seeding, preferably by daily broadcast application, hydro application and/or drilling or daily broadcast application, fertilizing and mulching where required, on disturbed lawns, ditch banks, berms and a portion of the leveled spoil as shown on the drawings. Topsoil shall be stripped, stockpiled and respread on all ditch bank and lawn areas disturbed where the Open Channel is constructed. Lawn areas may require supplemental topsoil.
29. Furnish and install 18,000 square yards of North American Green SC250 high velocity manufactured straw erosion blanket or equal to enhance establishment of vegetation on critical areas.
30. Resurfacing Eberhart Rd., Second St., bicycle path and McEwan St. with HMA matching existing asphalt after culvert installation.
31. Traffic control including signage for detour routes for new culvert installations at Eberhart Rd., Second St., bicycle path, and Dunlop Rd. and partial lane closure at McEwan St.