## $\begin{array}{c} Design \ of \ Trapezoidal \ Channel \ and \ calculate \ cut \ and \ fill \\ volume \end{array}$

After importing points, create surface, create profile create design level of your profile make the followings

Home tab> Assembly> name your assembly> ok> click somewhere in you space screen to create assembly.



Select your assembly> tool pallete> trench pipes tab> click on the channel> select your channel > properties> advanced parameters change the followings:

Depth 5m

Bottom width 10 m

Side slope 2:1

Linning depth  $0.1~{\rm m}$ 

Left extension height 1m

Right extension height 1m

Change others to 0





Go to the basic tab in the tool pallets window> BasicSidesSlopeCutDitch> click on the right top side of your channel and select your cut and fill lines> properties> cut slope >2:1> fill slope>2:1> change others to 0> after changing right click on the right cut and fill lines > mirror> click on the left top side of the channel





 $\label{eq:home-tab} \begin{array}{l} \text{Home-tab} > \text{corridors} > \text{name-your-corridor} > \text{select-alignment} > \text{select-design-profile} > \text{select-your-assembly} > \text{select-surface} > \text{ok} > \text{ok} > \text{build-the-corridor} \\ \end{array}$ 

A Create Corridor X
Name:
Channel_Corridor
Description:
~ ~
Corridor style:
Basic 🗸 🗸
Corridor layer:
C-ROAD-CORR
Baseline type:
Alignment and profile
○ Feature line
Alignment:
🚍 ALignment 🗸
Profile:
Design_Level
Assembly:
🔒 Channel 🗸
^
✓
Target Surface:
🖉 Surface1 🗸 🐨
Set baseline and region parameters
OK Cancel Help



Tool space> corridor> your corridor> right click > properties> surface tab> create a corridor surface> data type: links> specify code: datum> add a surface item> boundaries tab> right click on your corridors in the boundary tab> add automatically> daylight> apply> ok

	Start Drawing I		
	TOOLSPACE		TOOL PALETTES - CIVIL METRIC S
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E	Drawing1	^	
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	🖻 🗐 Point Groups		Devid an Transition
	[[] _All Points     []      []      []		BasicLanemansition
	Surface1		GenericPavementStructure
	Masks		
	- 🔗 Watersheds		ShapeTrapezoidal
	🖻 🏠 Definition		
	Boundaries		BasicShoulder
	Breaklines		
			BasicCurb
	Drawing Objects		Properties
	- 🔗 Edits		Corridor Section Editor
	🖓 Point Files		Rebuild
	● [�] Point Groups		Rebuild - Automatic
			Delete
	⊕ 🗇 Alignments		Drive
	↓ Feature Lines		Select
	Catchments		Zoom to
	The Networks		Pan to
	T Pressure Networks		Export LandXML
	🖃 <u>M</u> Corridors		P-for-h
	📴 🕥 Channel_Corridor	_	Refresh
	🗉 🖶 Assemblies		
🛕 Corridor Properti	ies - Channel_Corridor (1)		×
Information Parame	ters Codes Feature Lines Surfaces	Bo	oundaries   Slone Patterns
	- Add data		(5)
(2)	Auu uala		Continued as a second sec
	Data type:		Datum (1)
N			
Name	Surface Style Rende	r Ma	Add as Breakl Overnang Co Description
	hannel_C Contours 2 😤 ByLaye	r	None None
	vatum		
		_	
			OK Cancel Apply Help
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Home tab> sample line> select your alignment > select by range > left 20m, right 20m>ok

Sample Line To <[Sample Line Current methods)	Station Value] > 🔐 👘	Àlig	ynment name: ALigr	Iment	
Name: Channel_Sam Description:	pleLine		Sample line style: 	Line tyle:	
ALignment Select data sou	irces to sample:		]		
Type	Data Source Surface 1 Channel_Corridor Channel_Corridor	Sample	Style Existing Ground Basic Existing Ground	Section layer C-ROAD-SCTN C-ROAD-CORR-SC. C-ROAD-SCTN	Update Mode Dynamic Dynamic Dynamic
1				OK Cance	el Help

Analyze tab> compute materials> select alignment and sample line> ok>select your surface in the first surface> and corridor surface in the datum  $4^{\text{th}}$  surface.>ok

🔹 🔿 👻 🔆 Civil 3D 🚽 🖛	Autodesk Civil 3D 2019 Drawing1.dwg
Modify     Analyze     View     Manage     Output     Survey       Image: Output     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output     Image: Output       Visibility     Image: Output     Image: Output     Image: Output     Image: Output       Visib	Autodesk InfraWorks Collaborate Help Add-ins Express Tools Featured Apps WaterCAD Lay The second sec
<ul> <li>TOOL PALETTES - CIVIL METRIC S</li> <li>Metric Basic Subassemblies</li> <li>Metric Basic Lane</li> <li>BasicLane</li> <li>BasicLaneTransition</li> <li>GenericPavementStructure</li> <li>ShapeTrapezoidal</li> </ul>	Top][2D Wireframe Select a Sample Line Group X Select alignment: Alignment Select sample line group: Channel_SampleLine OK Cancel Help
Compute Materials - Channel_Sample Quantity takeoff criteria: Cut and Fill	Line × Volume calculation method: Volume calculation method: Average End Area × 1.0000 (d) Map objects with same name
Name in Criteria Surfaces G C C C C C C C C C C C C C	Object Name       Material Name <click all="" here="" set="" to="">       "VARIES" Surface         Surface1       Ground Removed         Surface1       Ground Fill         <click all="" here="" set="" to="">       WARKS         Channel_Corridor Channel_Corr       Ground Removed ridor         Channel_Corridor Channel_Corr       Ground Fill         Channel_Corridor Channel_Corr       Ground Fill</click></click>
	OK Cancel Help

Home tab> section views> create multiple view>next  $\dots$  next >create section views> click on a space to make sections.

A Create Multiple Section	Views - General					×
General	Select alignment:		Sample line	group name:		
Section Placement	'=;> ALignment ∨	i,	[] Chann	el_SampleLine	~	
Offset Range	Station range	Start:		End:		
Elevation Range		0+000.00m	105	1+617.00m		
Section Display Options	User specified:	0+000.00m		1+817.08m	-12	
<u>Data Bands</u>	Section view name:					
Section View Tables	Description:	<u> </u>				
	Section view layer:					
	C-ROAD-SCTN-VIEW	<b>\$</b>				
	Section view style:	<b>,</b> •				
	< Back Next	> Create	Section View	s Cancel	Help	

Select a section> view group properties>change volume tables> volume table window popup> type: material> style: basic> add> in position of tables> section view anchor: bottom center> table anchor> tope center> table layout: horizontal> ok>ok

Section View Group Pro	operties - Sectio	on View Group	- 1						- 0	Х
Section Views Sections Sł	neets									
Sample line group name: Alignment name:										
Channel_SampleLine ALignment										
Section view list:										
Section View	Group Plo	Style	Change Band Set	Change Volume Tables	Profile Gr	Offset and Elevation	Station	Start stati	End station	
Section View	. Basic	Road Secti						0+020.00	1+800.00	
			·							
						ОК	Cancel	Apply	y He	elp

A Change Volume Tables - Section View Group - 1	– 🗆 X
The section view(s) include volume tables. Please select volume table type(s) to draw.          Type:       1         Material       Select table style:       2         List of volume tables       Image: Control of the style s	3 Add>>
Table type Style Material list Materials Layer Split Gap R Material Basic III Material Lis Inc-ROAD-S Yes Dy	eactivity
Position of table(s) relative to section view          Section view anchor:       Table anchor:       Table Layout:         Bottom Center        Top Center        Horizontal          X offset:       Y offset:       6         0.00mm       0.00mm       7	
OK Cancel Ap	ply Help

	Q + ( 730 780 890 800 870 -300 -10		0+ 730 720 700 800 870 870 - <b>210</b> -11	
Ground Removed				

Analyze table > total volume tale > cut and fill> ok> click in a space to make tables



Total Volume Table									
Station	Fill Area	Cut Area			Cumulative Fill Vol	Cumulative Cut Vol			
0+020.00	2.04	132.77	0.00	0.00	0.00	0.00			
0+040.00	10.00	132.41	120.41	2651.78	120.41	2651.78			
0+060.00			297.60	2256.00	418.00	4907.79			
0+080.00	12.89	84.77	326.48	1779.66	744.49	6687.45			
0+100.00	20.92	66.42	333.97	1515.49	1078.46	8202.94			
0+120.00	13.01	84.50	339.29	1509.14	1417.75	9712.09			
0+140.00	6.22	100.01	192.30	1845.09	1610.05	11557.17			
0+160.00	4.26	104.54	107.78	2042.36	1717.83	13599.53			
0+180.00	2.62	112.00	74.58	2157.40	1792.41	15756.93			
0+200.00	2.22	112.85	50.03	2244.66	1842.44	18001.59			
0+220.00	0.47	121.40	26.85	2342.54	1869.29	20344.13			
0+240.00	0.63	139.60	11.22	2606.18	1880.51	22950.31			
0+260.00	0.94	140.70	15.74	2802.96	1896.25	25753.27			
0+280.00	0.47	125.54	13.56	2667.62	1909.81	28420.89			
0+300.00		134.62	12.60	2601.55	1922.41	31022.44			
0+320.00		109.69	42.55	2443.09	1964.97	33465.53			
0+340.00	6.40	97.87	98.67	2075.57	2063.63	35541.09			
0+360.00	0.00	112.65	63.98	2105.18	2127.62	37646.27			
0+380.00	9.80	147.53	93.33	2613.83	2220.95	40260.10			
0+400.00		123.66	201.81		2422.75	42997.41			