Victoria ID (HP Envy 2024) - Dan Dwyer, ID Lead, CAD Journal

CAD Software: CREO DM is what RnD Team uses so all supplied parts will be in that format. Also used Alias and SolidWorks.

Dan Dwyer's CAD Log,
updated May 6th

Resizing depth of printer and CAD for cost reduction

…Before and after…

- 15 cents and easier assembly

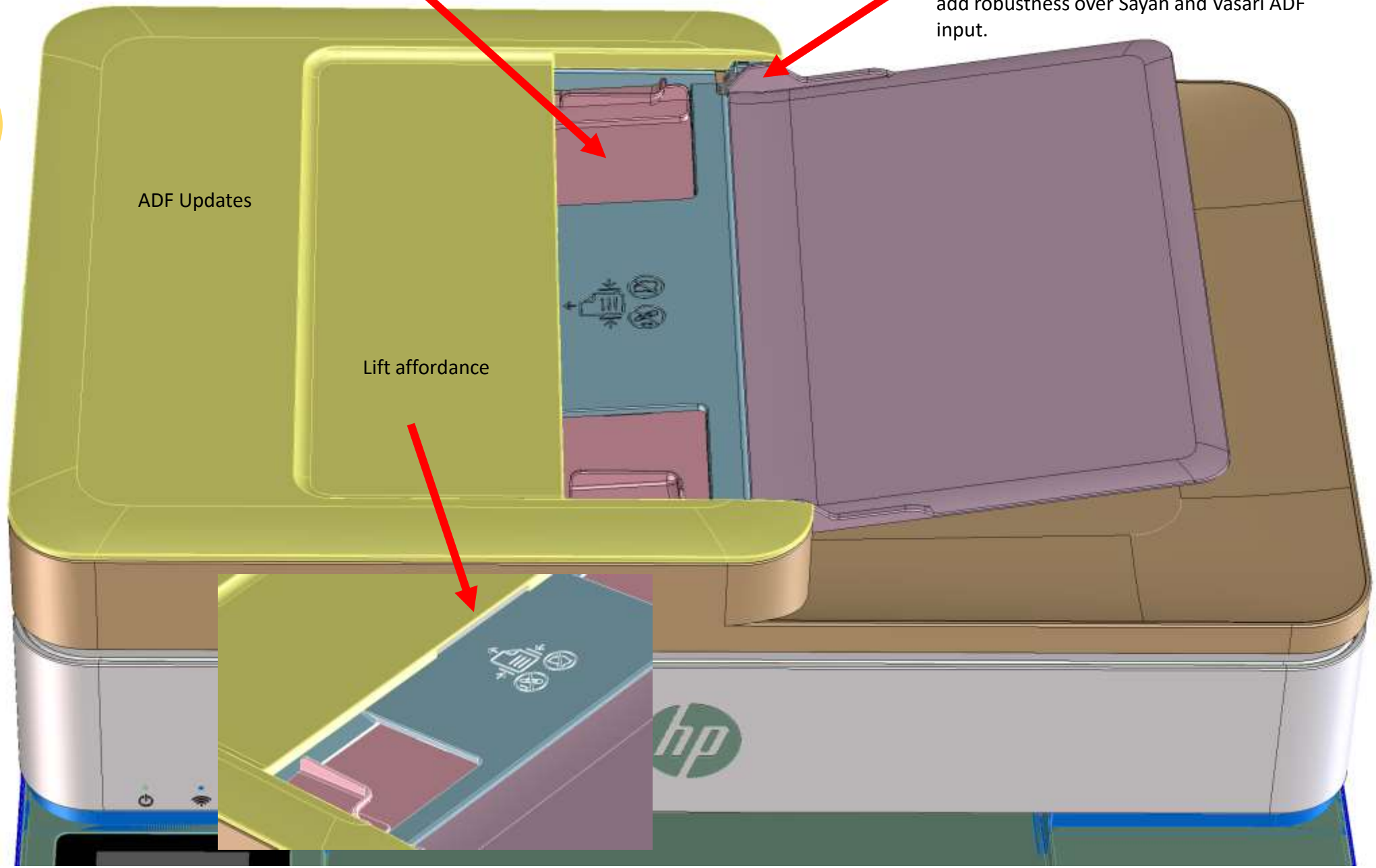
CD2

Cleaner, Sayan leveraged adjusters

Swapped pivot side for CD2. Pivot is longer to add robustness over Sayan and Vasari ADF input.

ADF Updates

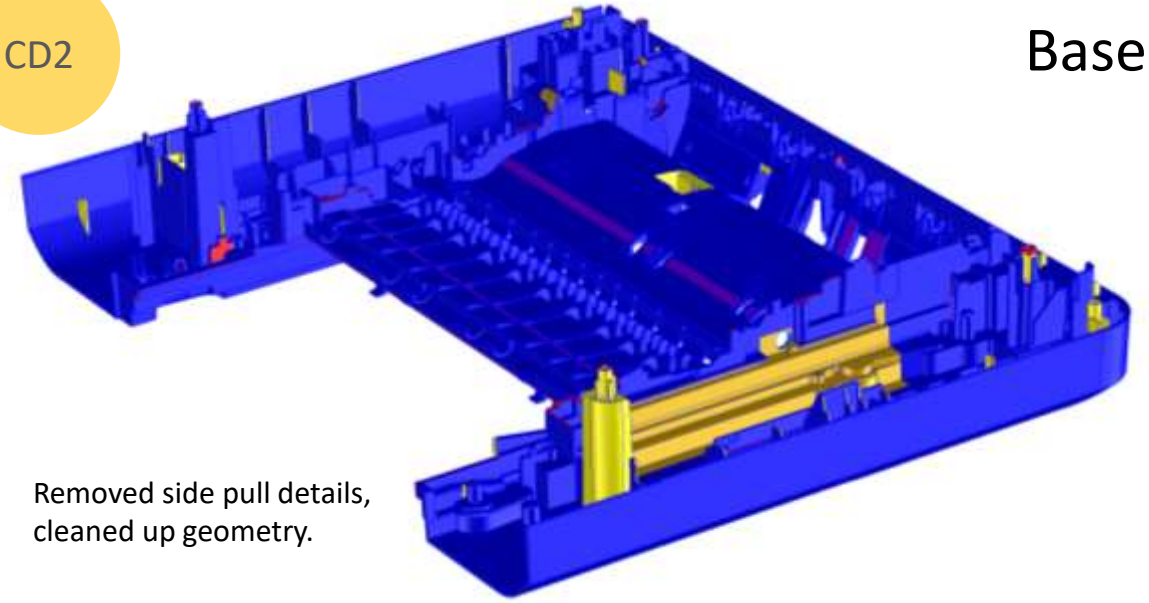
Lift affordance



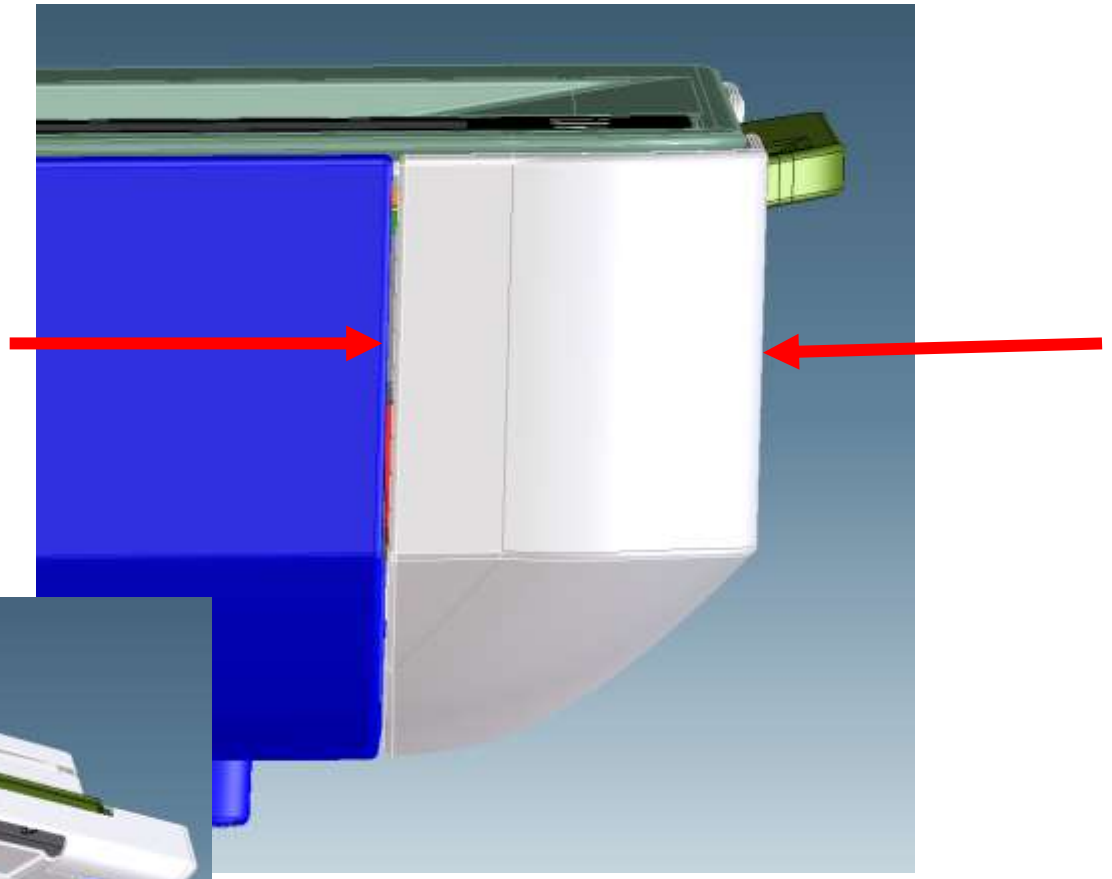
Resizing depth of printer and CAD for cost reduction

CD2

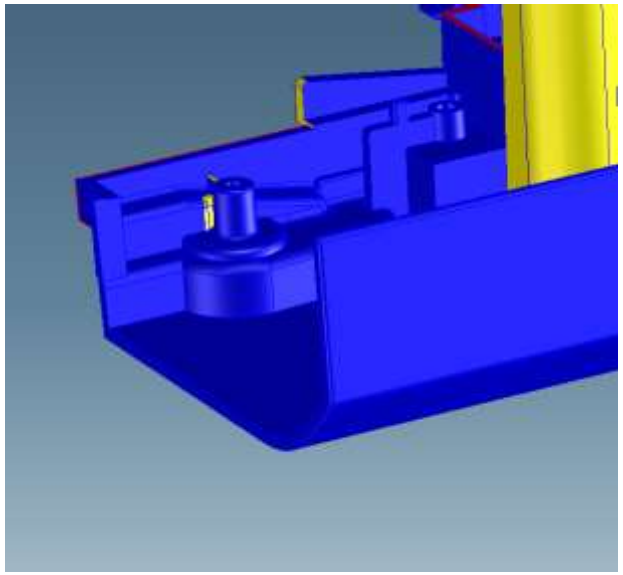
Base Part

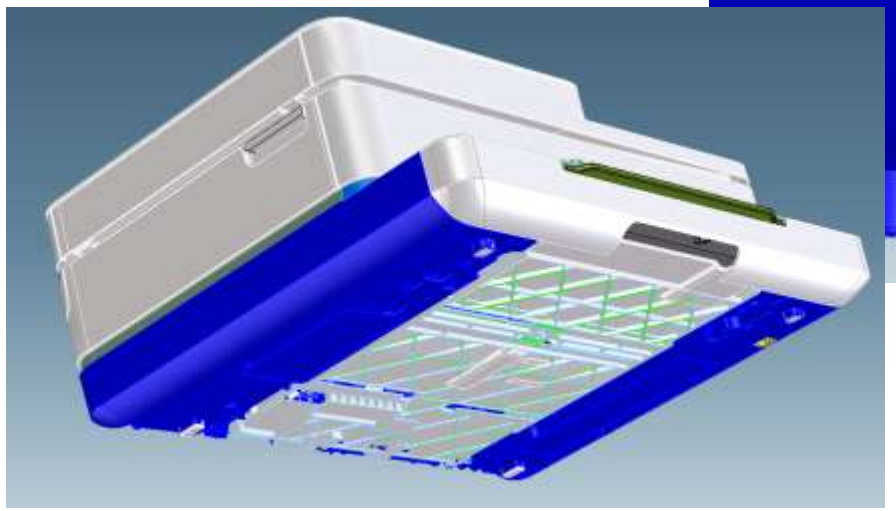


Removed side pull details, cleaned up geometry.



The latest base part was loaded from ModelMgr on May 6th, then modified.





Tray-input front is 26mm deep (Y). Close to same as previous CD1 thickness…

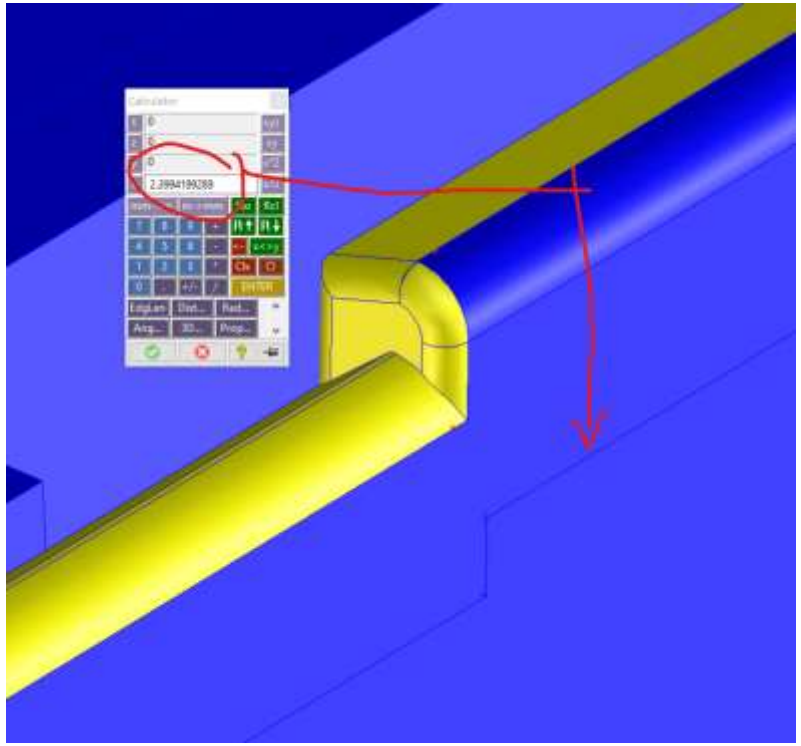
Gap is currently .5mm same as Vasari, but I will consider 1 larger gap on CD2…

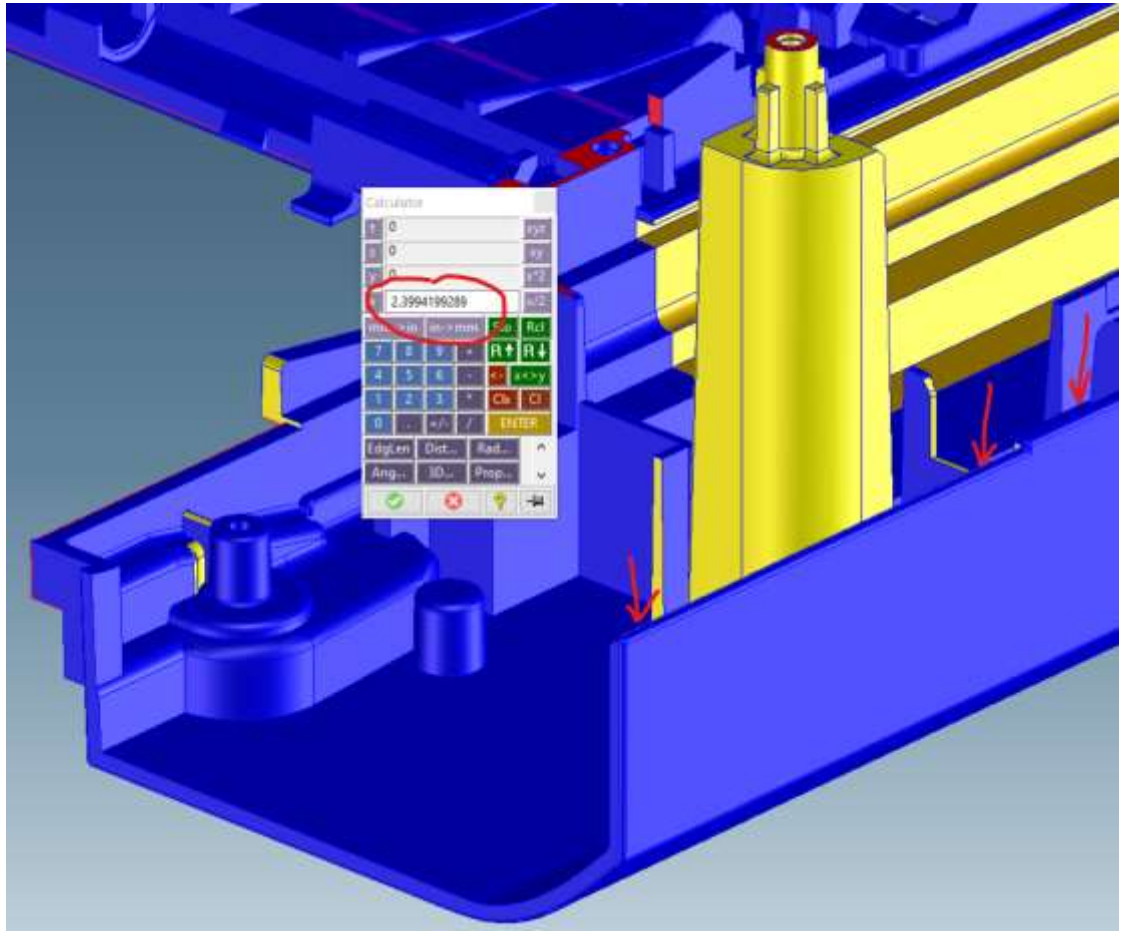
Resizing depth of printer and CAD for cost reduction

CD2

Base Part

Previous base



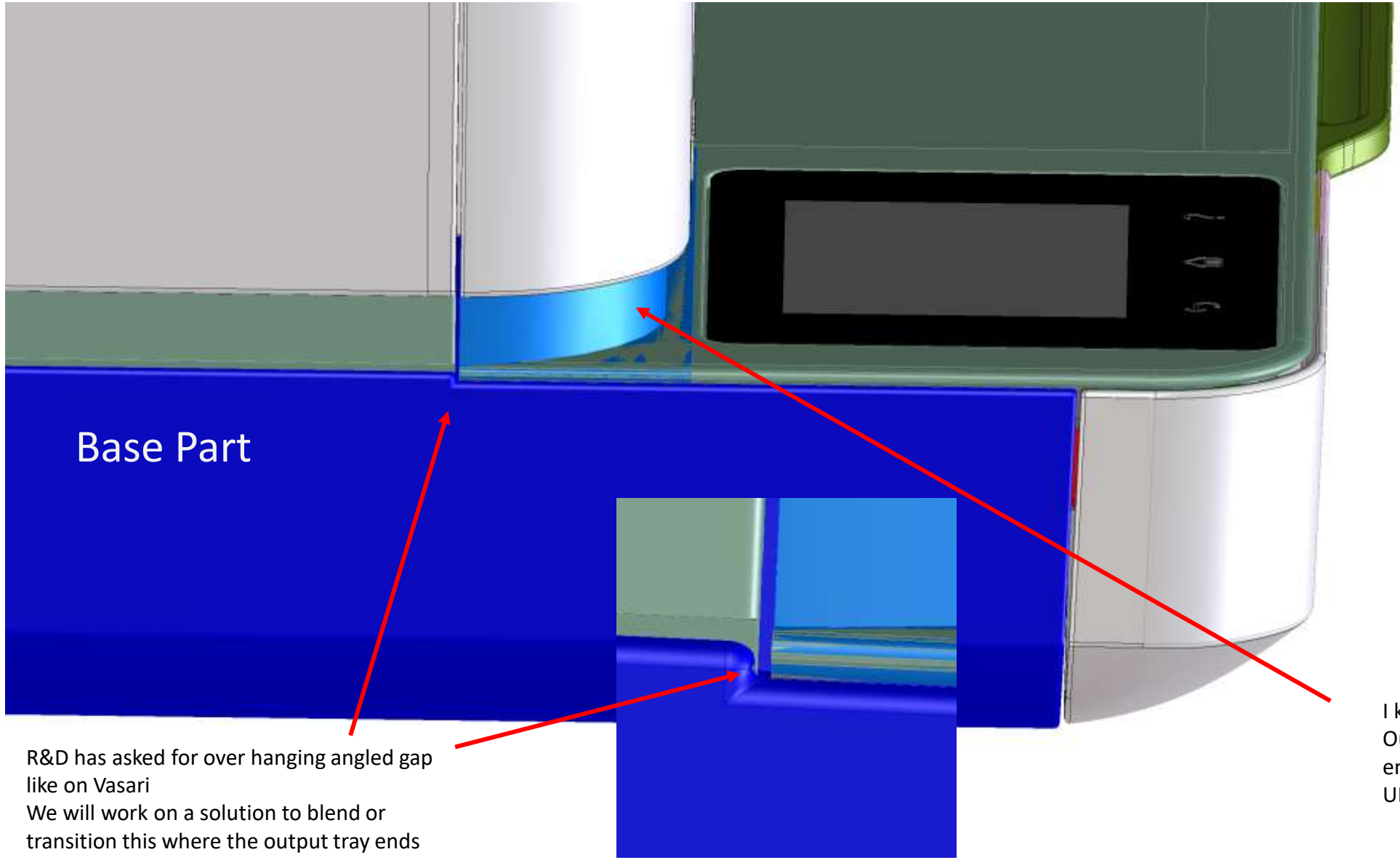


The top of the base is now 2.3994mm lower to match new output tray design (output tray part no longer has dished area at sides)

The top of the base is now 2.3994mm lower to match new output tray design (output tray part no longer has dished area at sides)

Resizing depth of printer and CAD for cost reduction

CD2



R&D has asked for over hanging angled gap like on Vasari
We will work on a solution to blend or transition this where the output tray ends

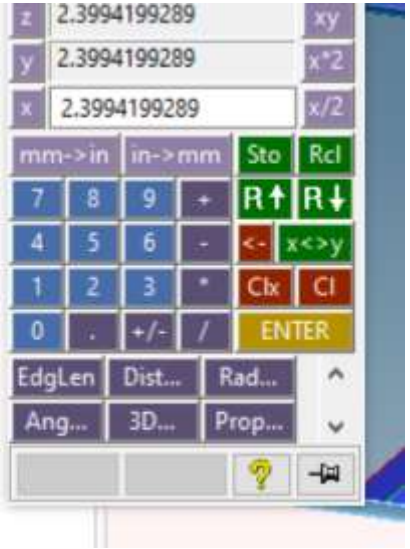
I kept this portion of Tray-Output as separate so engineers can modify and UNITE…

Resizing depth of printer and CAD for cost reduction

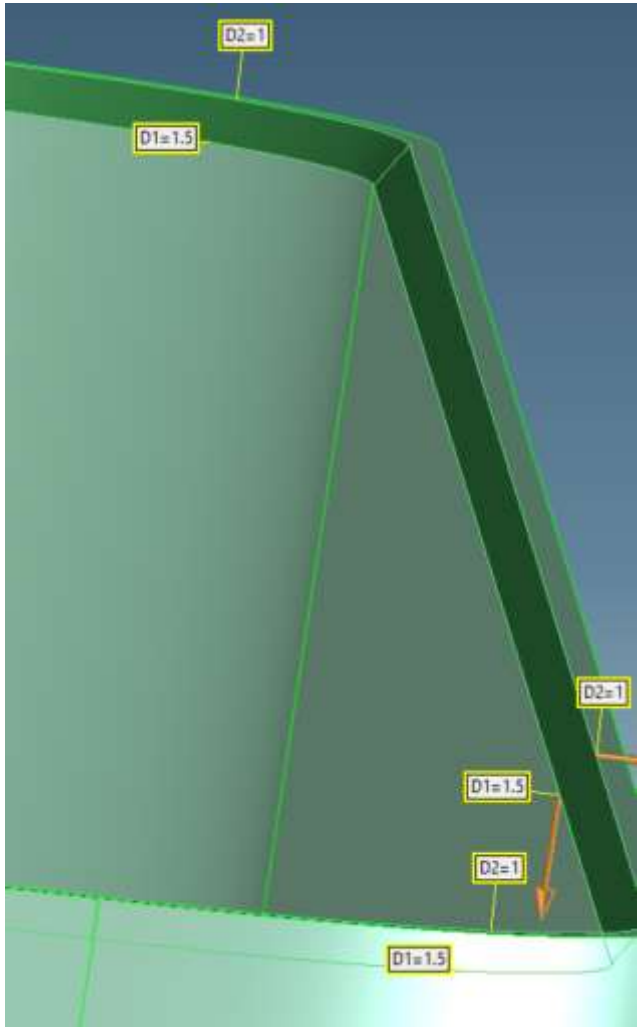
CD2

Base Part

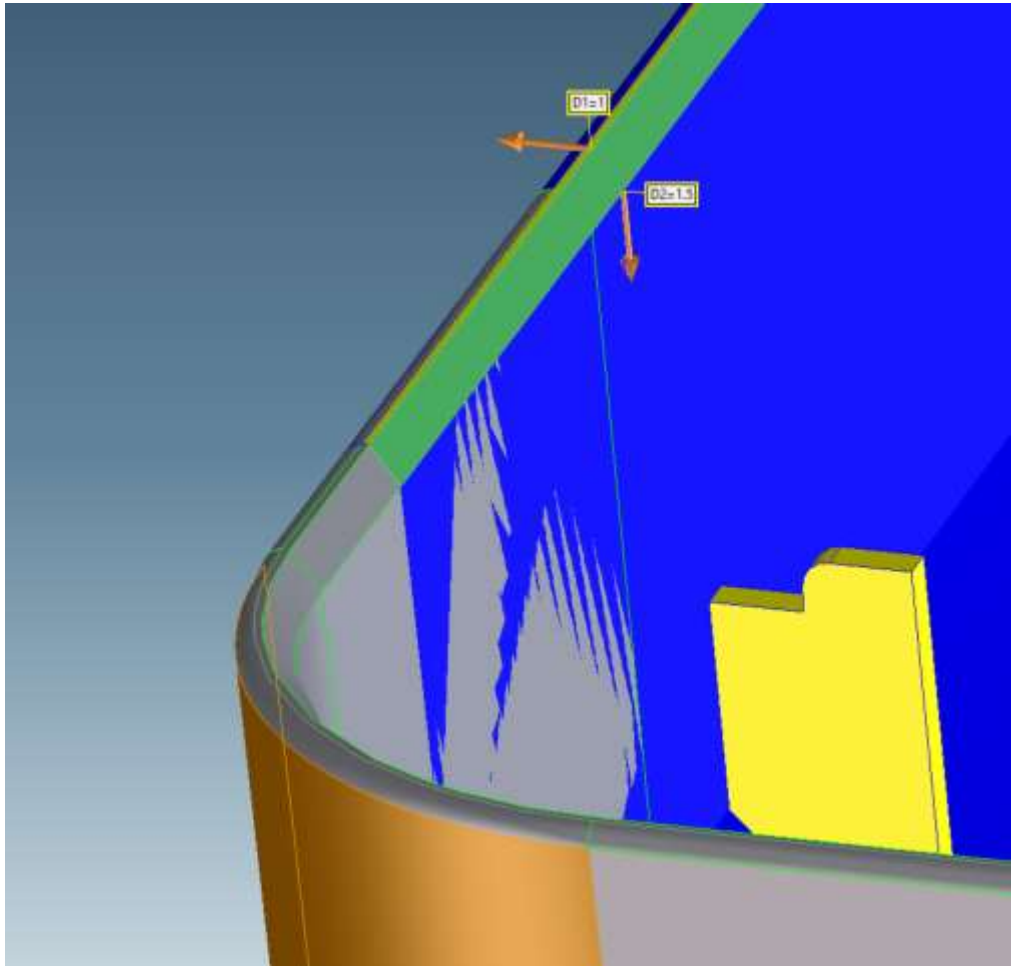
Base is lower



Chamfer dist-dist on tray front (same as Vasari)



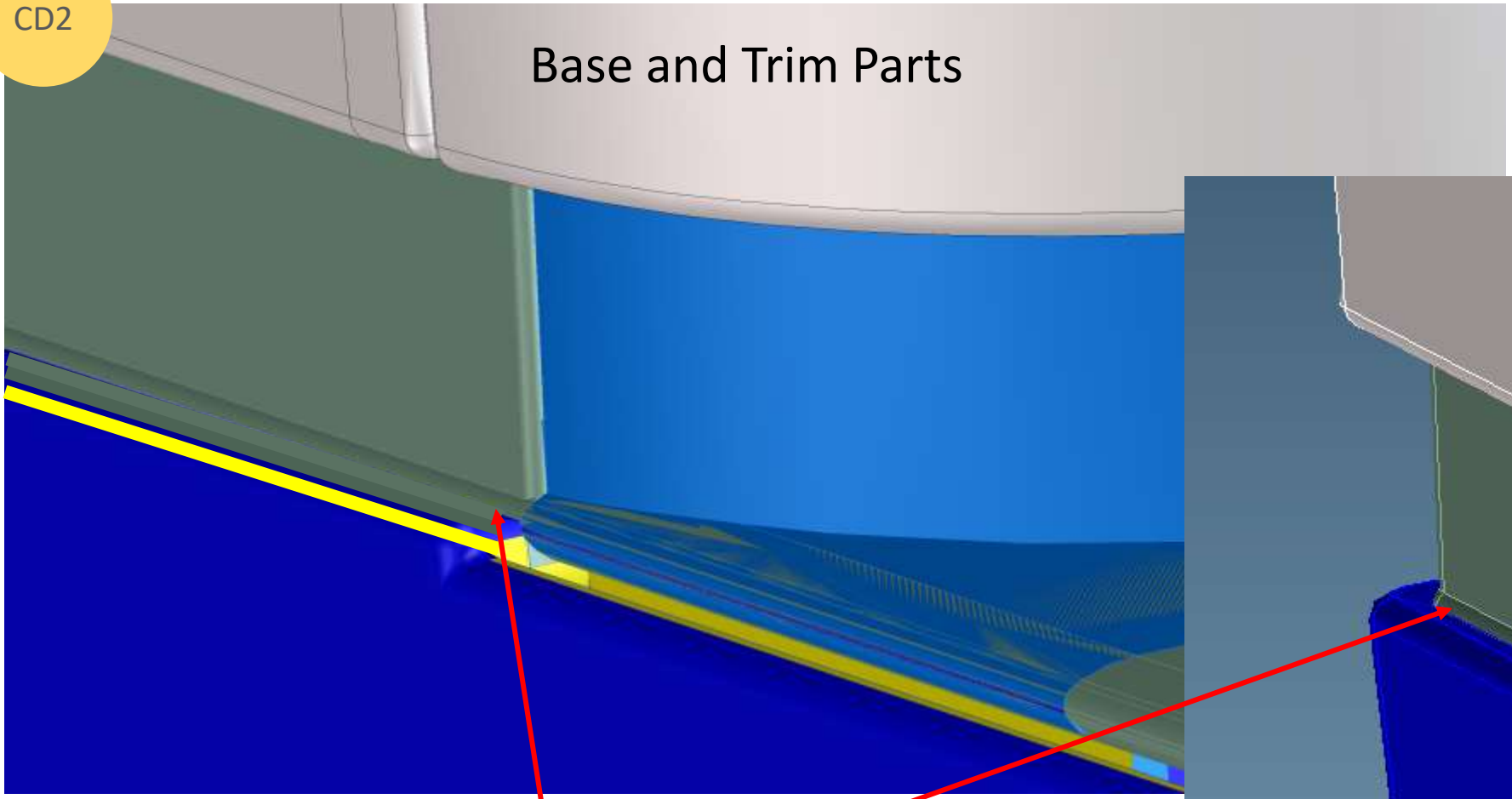
Chamfer dist-dist on tray front (same as Vasari)

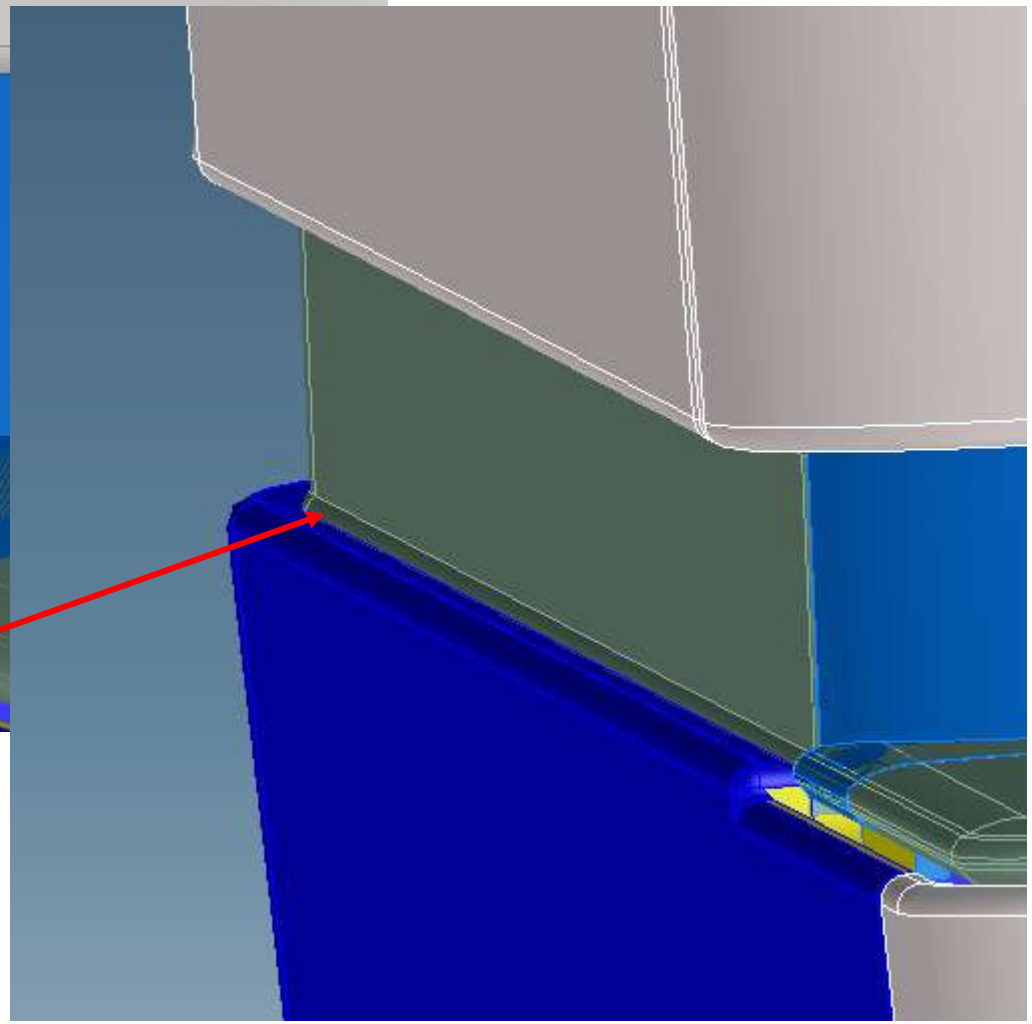


Resizing depth of printer and CAD for cost reduction

CD2

Base and Trim Parts





Alternative gap approach:

What if we continued chamfer on base all the way around (no step)
and add a rib at the bottom of the trim parts.
It may not be moldable? But worth the investigation.

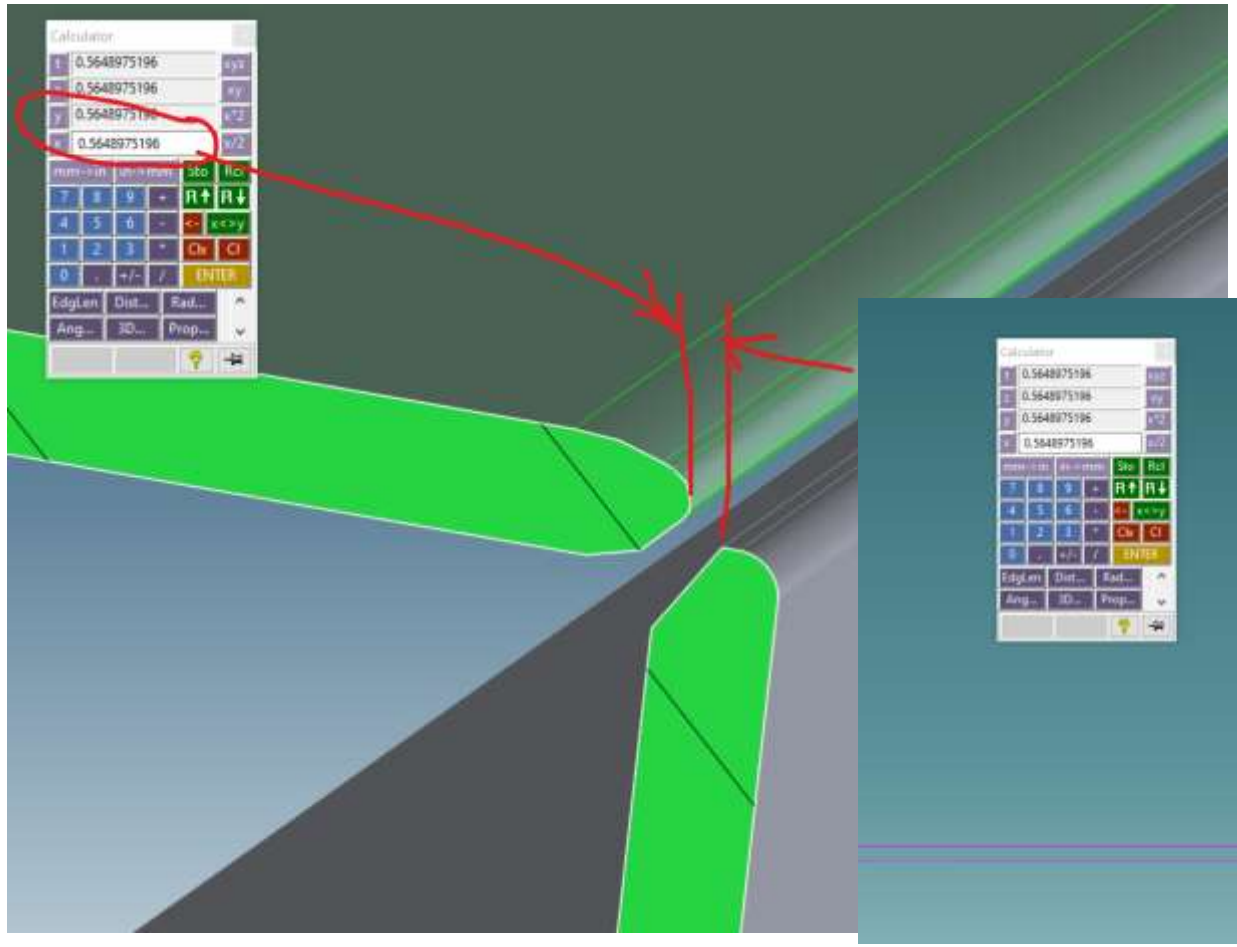
Resizing depth of printer and CAD for cost reduction

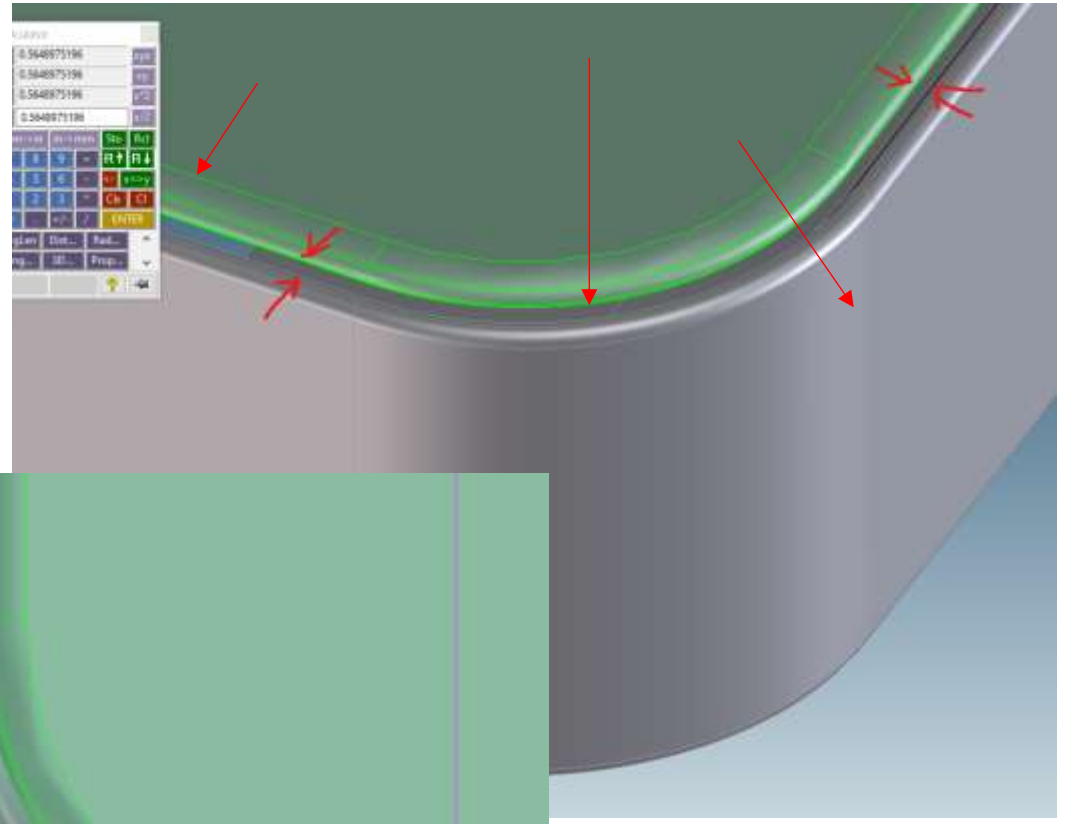
CD2

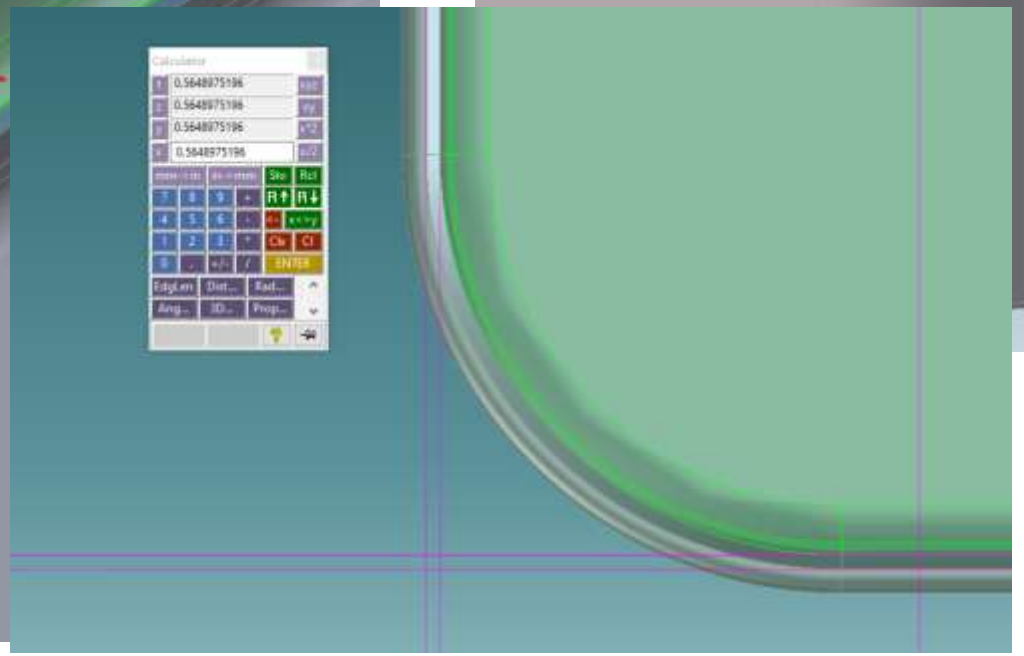
Base Part and Tray-Output Gap

Distance from edge of output to edge of chamfer on base and tray-input front (.565mm - same as Vasari)

Distance from edge of output to edge of chamfer on base and tray-input front AND sides (.565mm - same as Vasari)







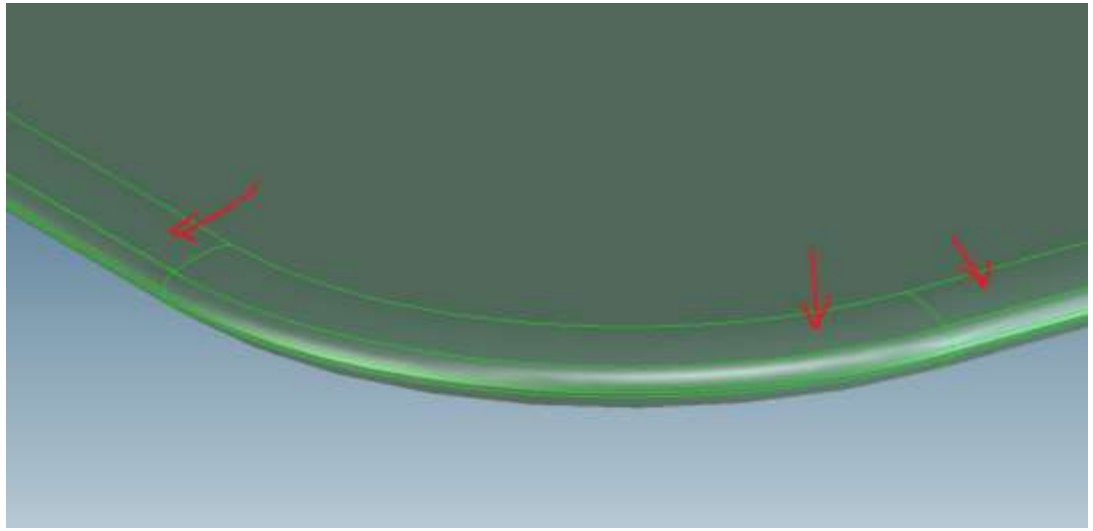
Resizing depth of printer and CAD for cost reduction

CD2

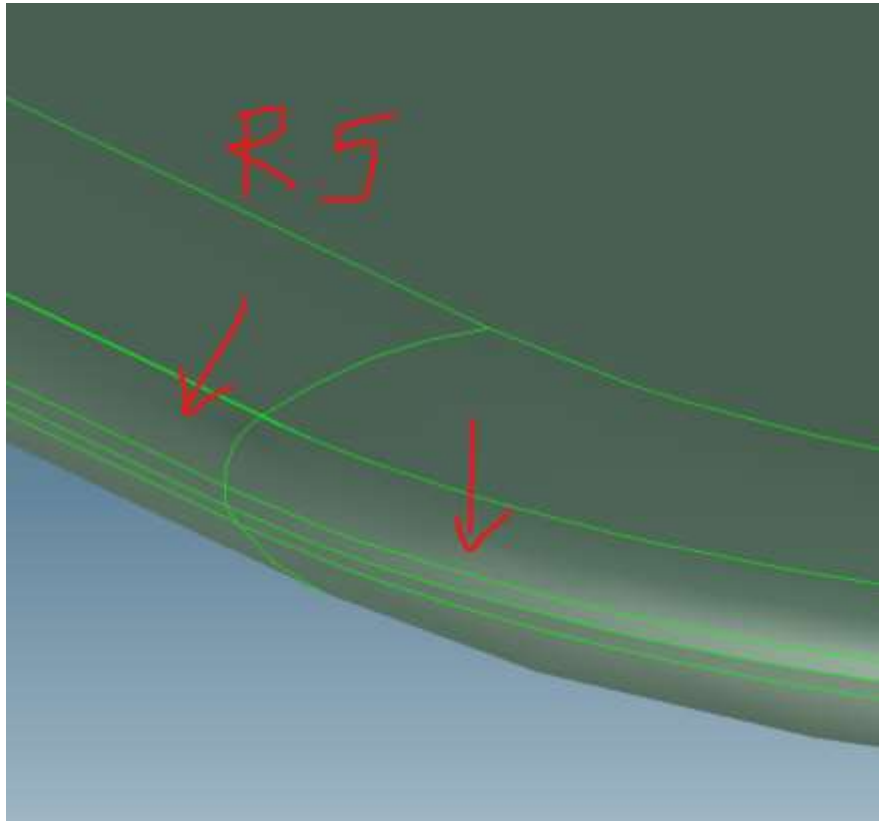
Tray-Output

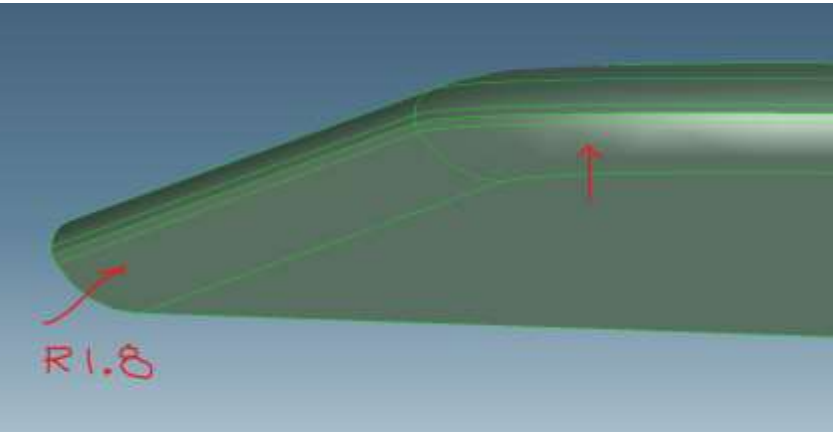
Output top

5mm Curvature Continuous Radius



radii is .5mm



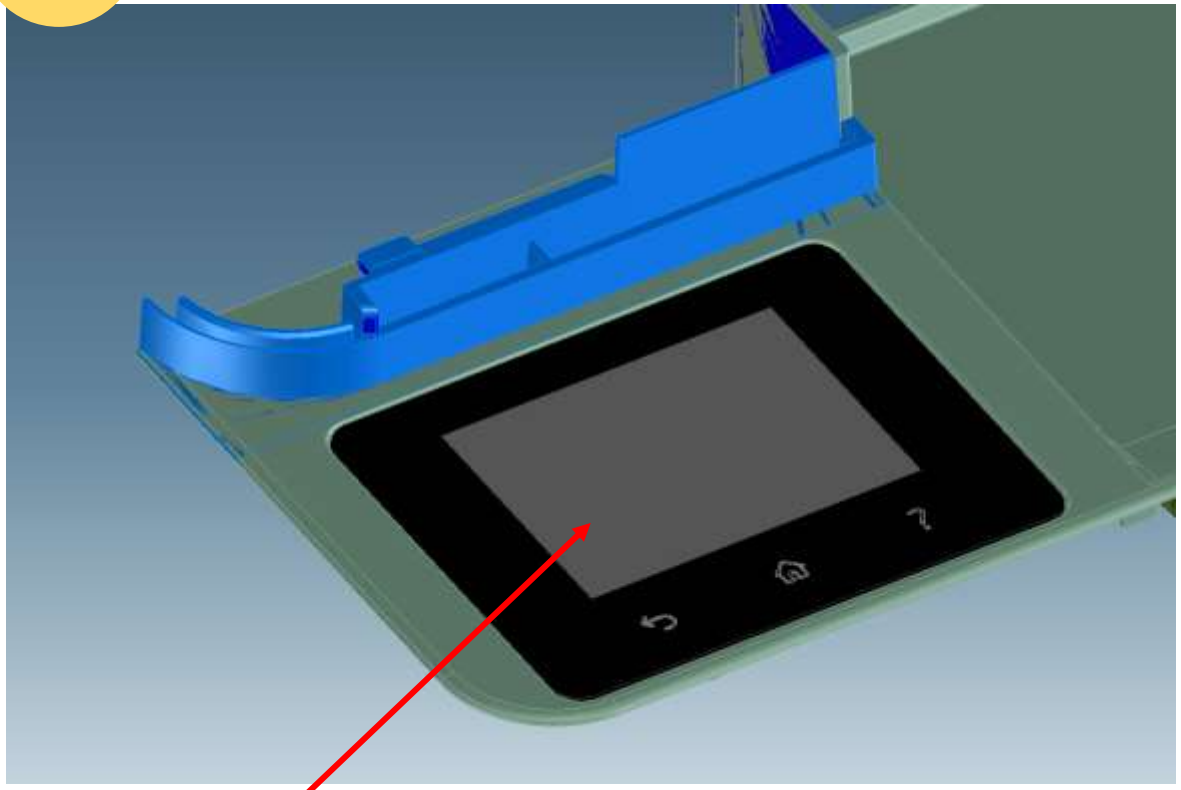


Bottom radii is 1.8mm

Resizing depth of printer and CAD for cost reduction

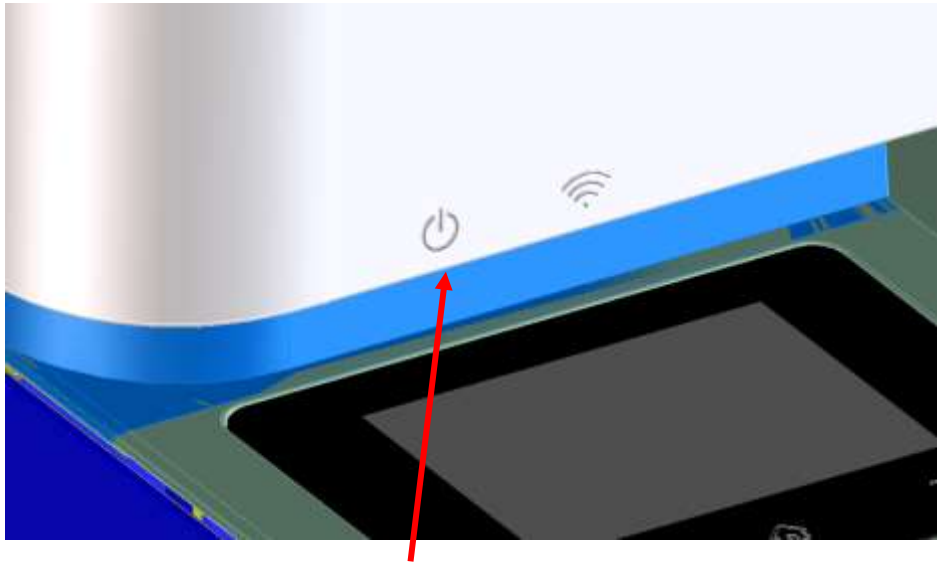
CD2

Tray-Output

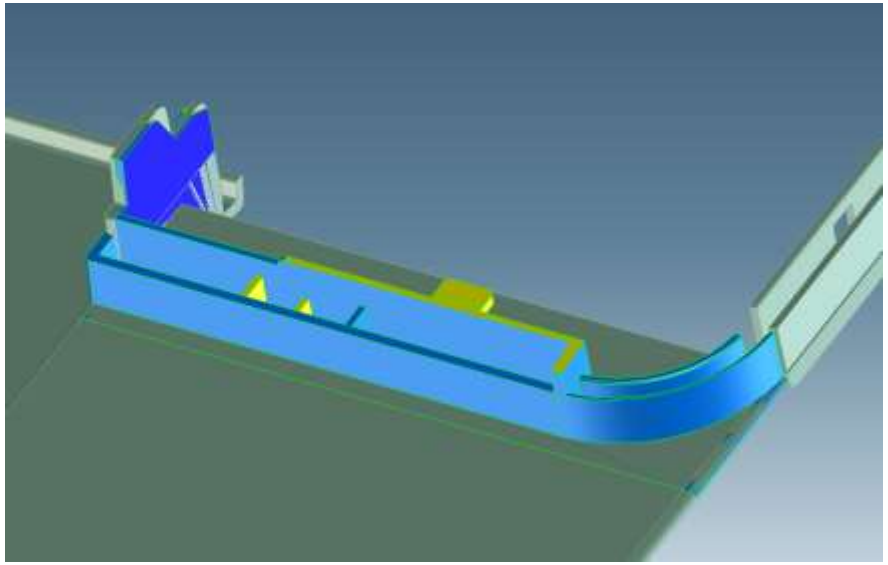


I kept this portion of Tray-Output as separate so engineers can modify and UNITE…

Note control panel is on left to save cost of FFC cable



Moving LEDS and icons to previous location, Otherwise they would shine on control panel.
Will assess embossed vs debossed (GxD preference is debossed/recessed)



CD2

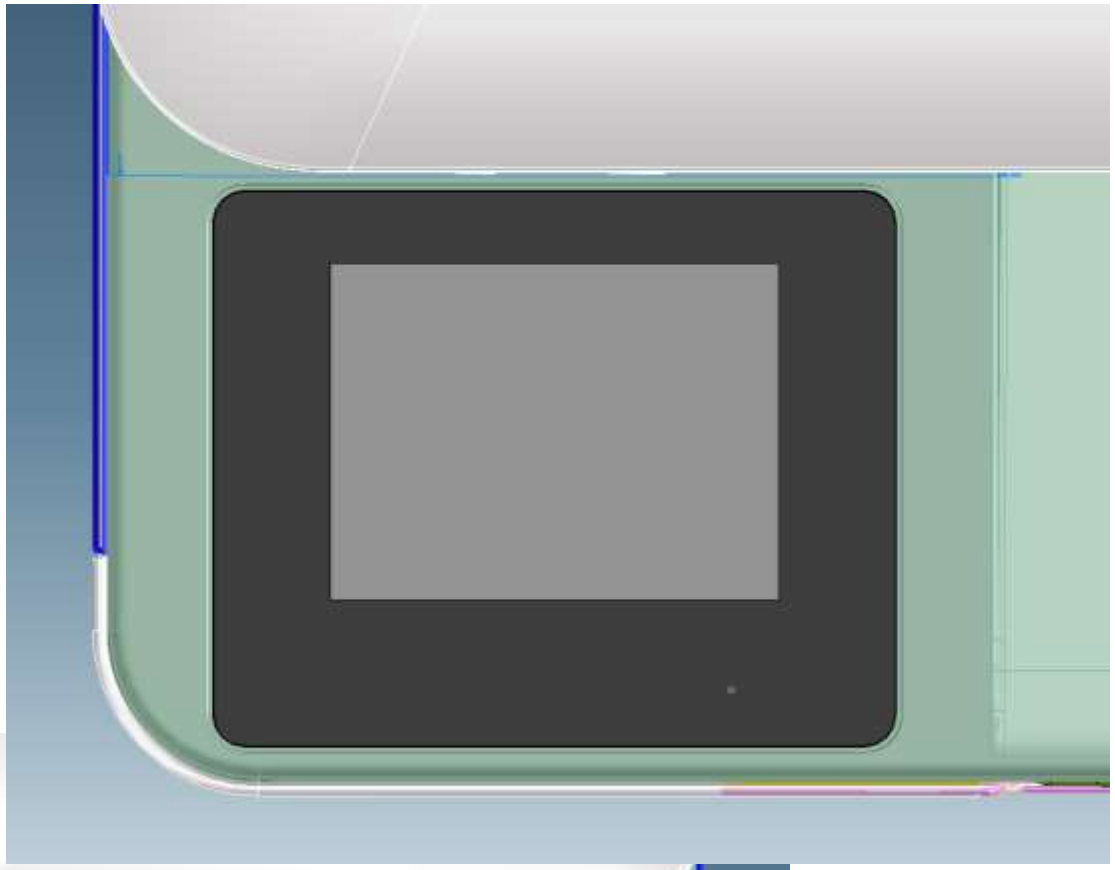
Tray-Output and Control Panel

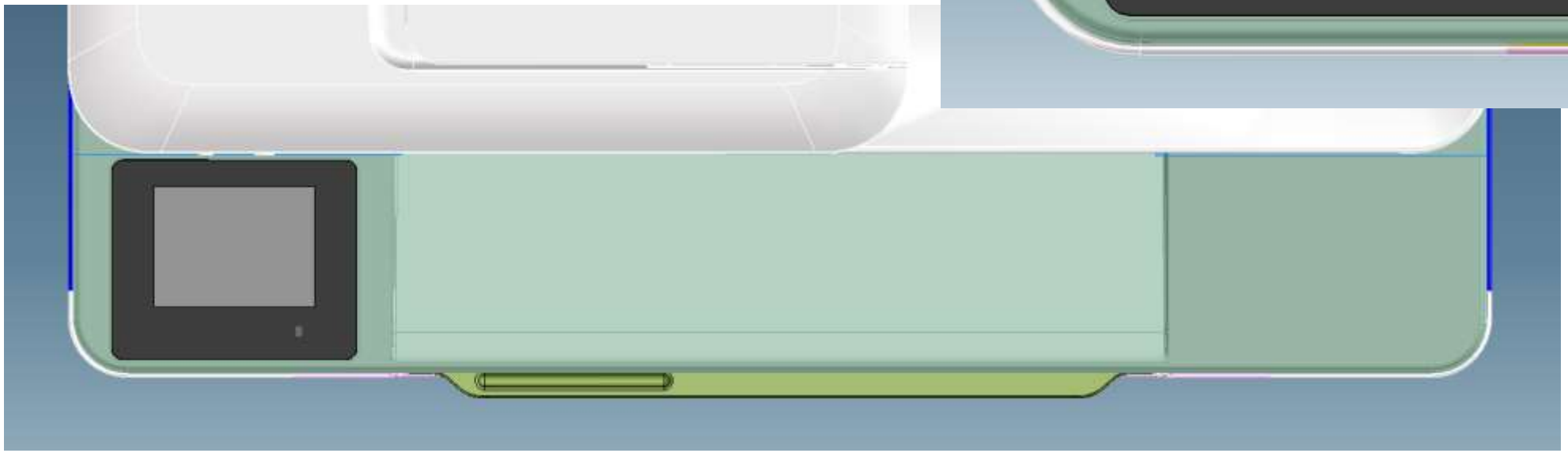
UNDER INVESTIGATION:

The control panel was moved to the left side to save cost – shorter FFC cable

Visually centered (but not exactly centered) between tray and outside of tray-output part…

Can tweak location after we review CD2 and cosmetic model.

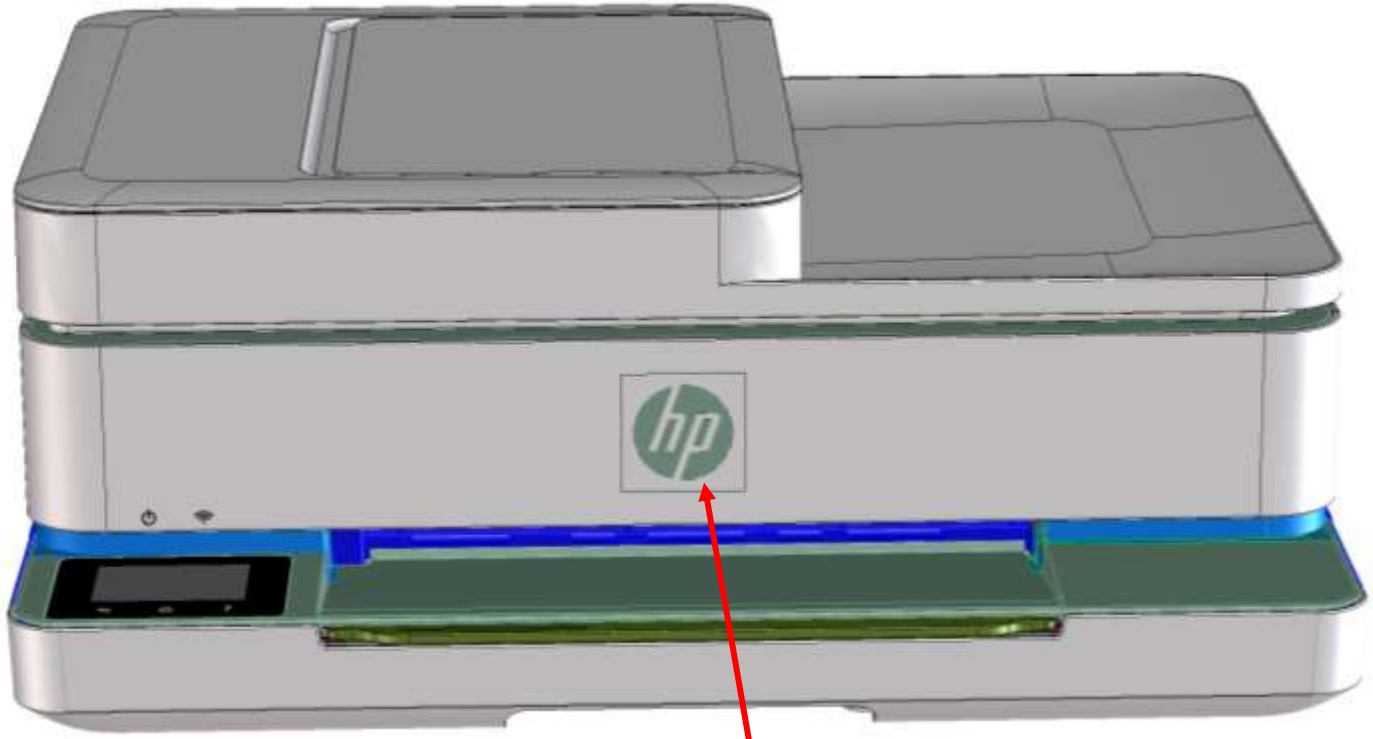




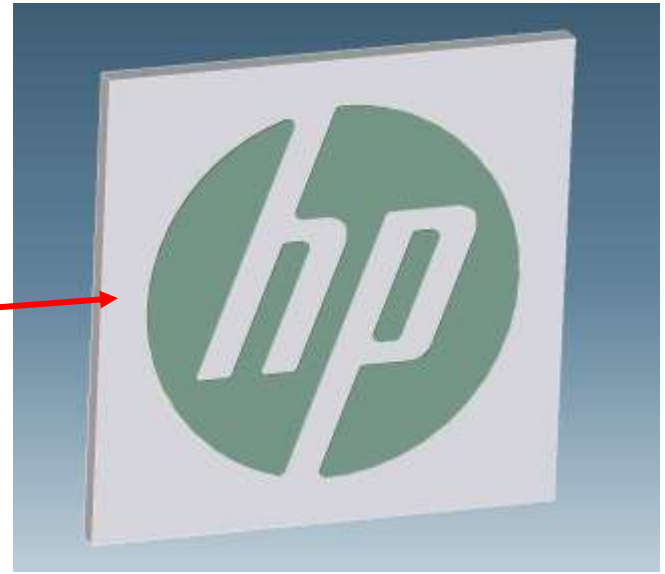
Resizing depth of printer and CAD for cost reduction

CD2

Logo Jewel CAD

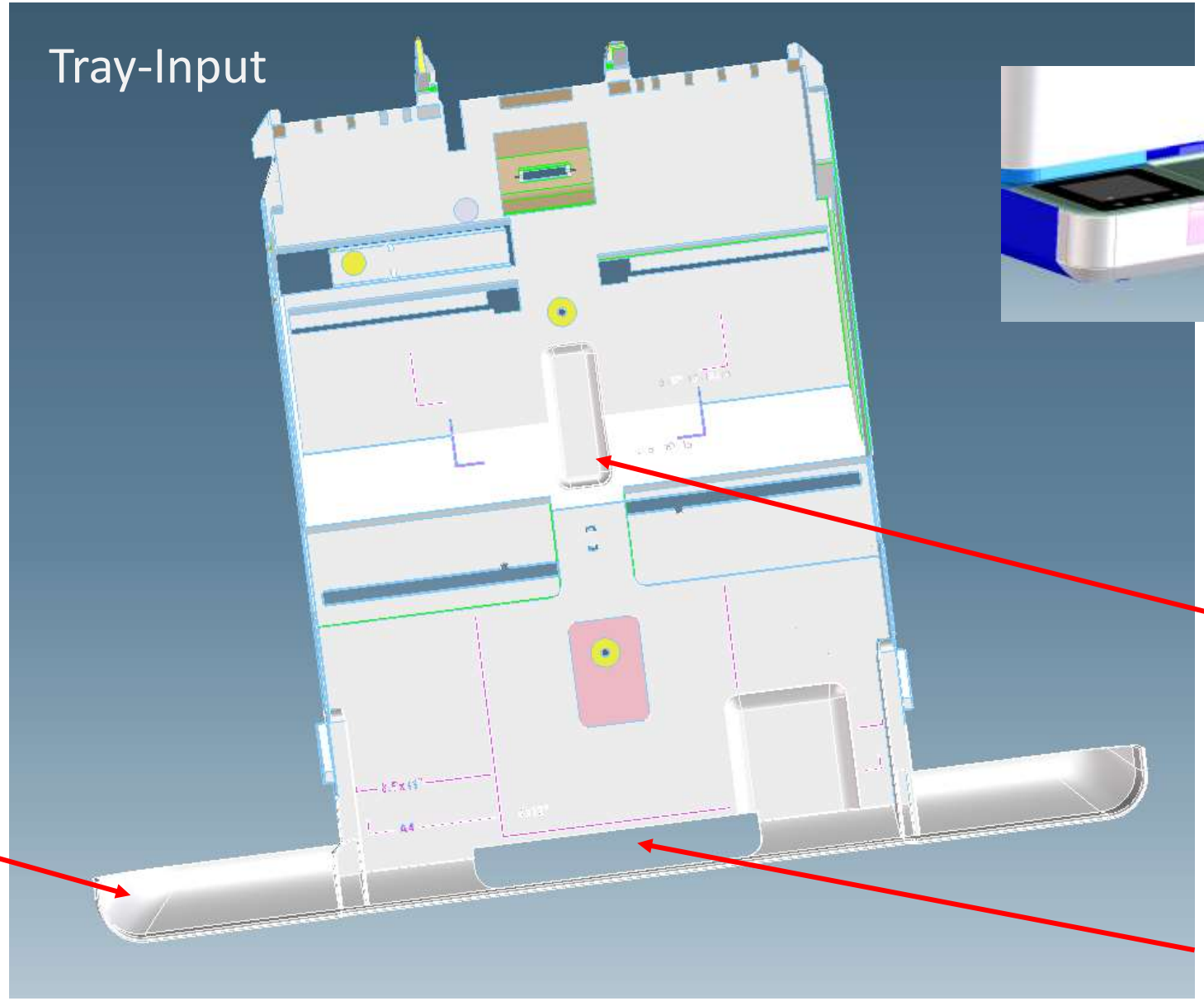


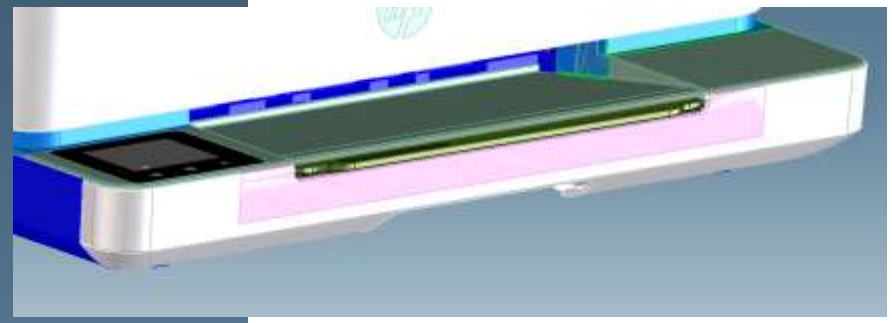
32mm Logo and pocket
Size/location



Resizing depth of printer and CAD for cost reduction

CD2





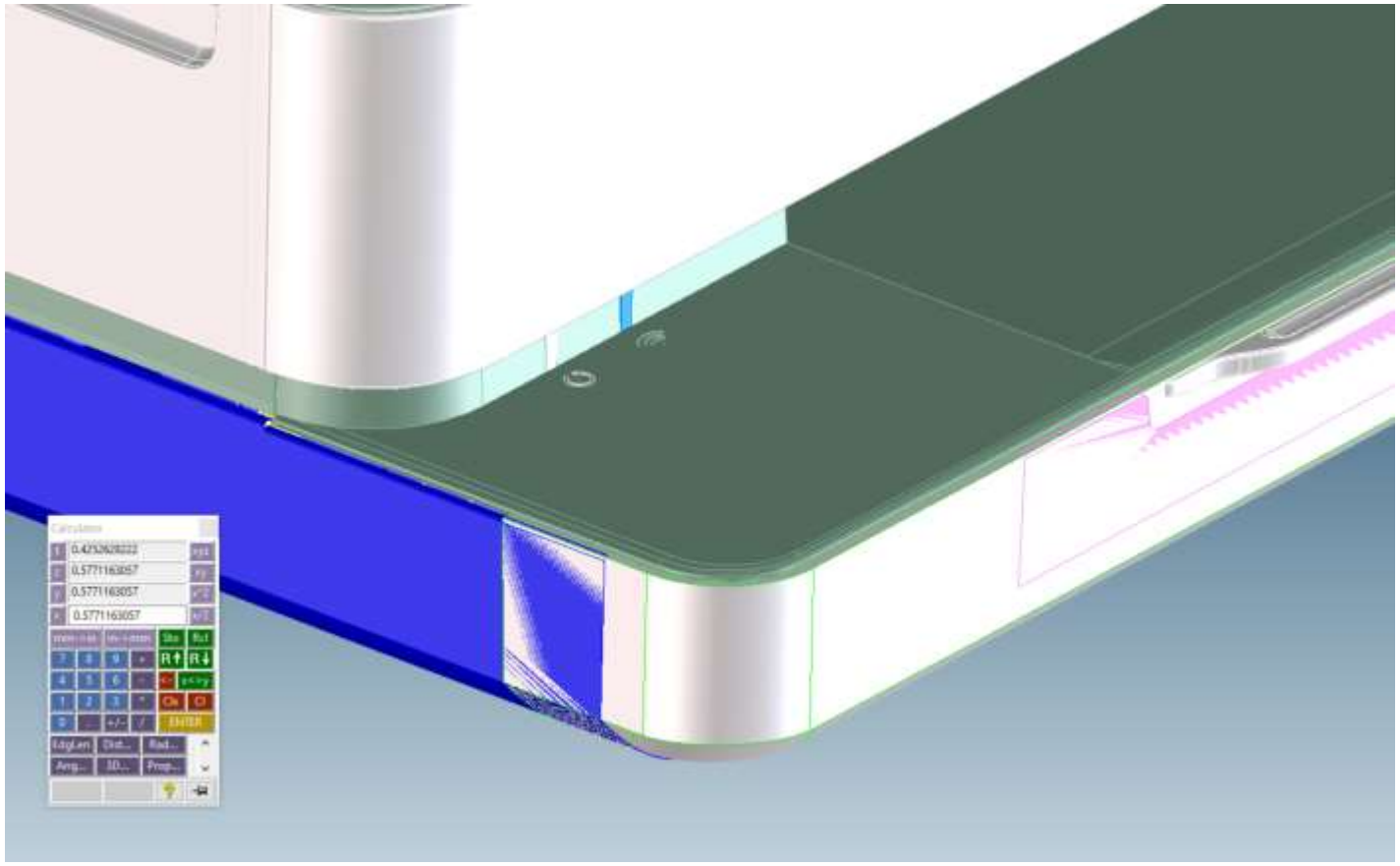
Front of tray is aligned with Vasari tray (in pink) – same product depth!

Tray and removal scoops are reference – please modify main tray as needed!

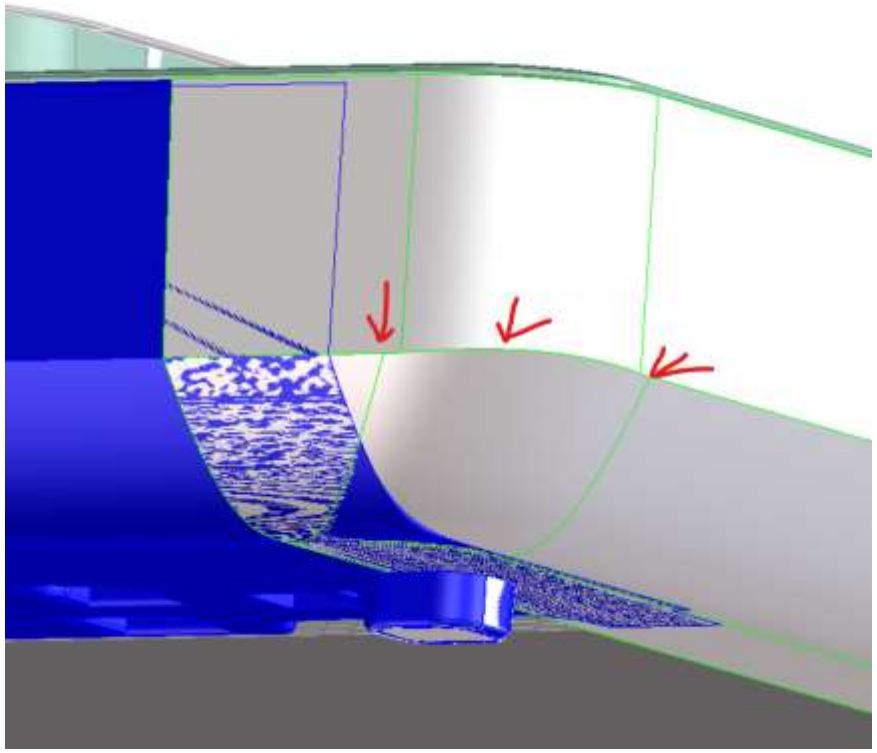
26mm thick

Handle is probably not deep enough. If it is deeper we will need to remove the 4x12 marking line towards the front.

Rebuilding tray-input corner radii – in Alias



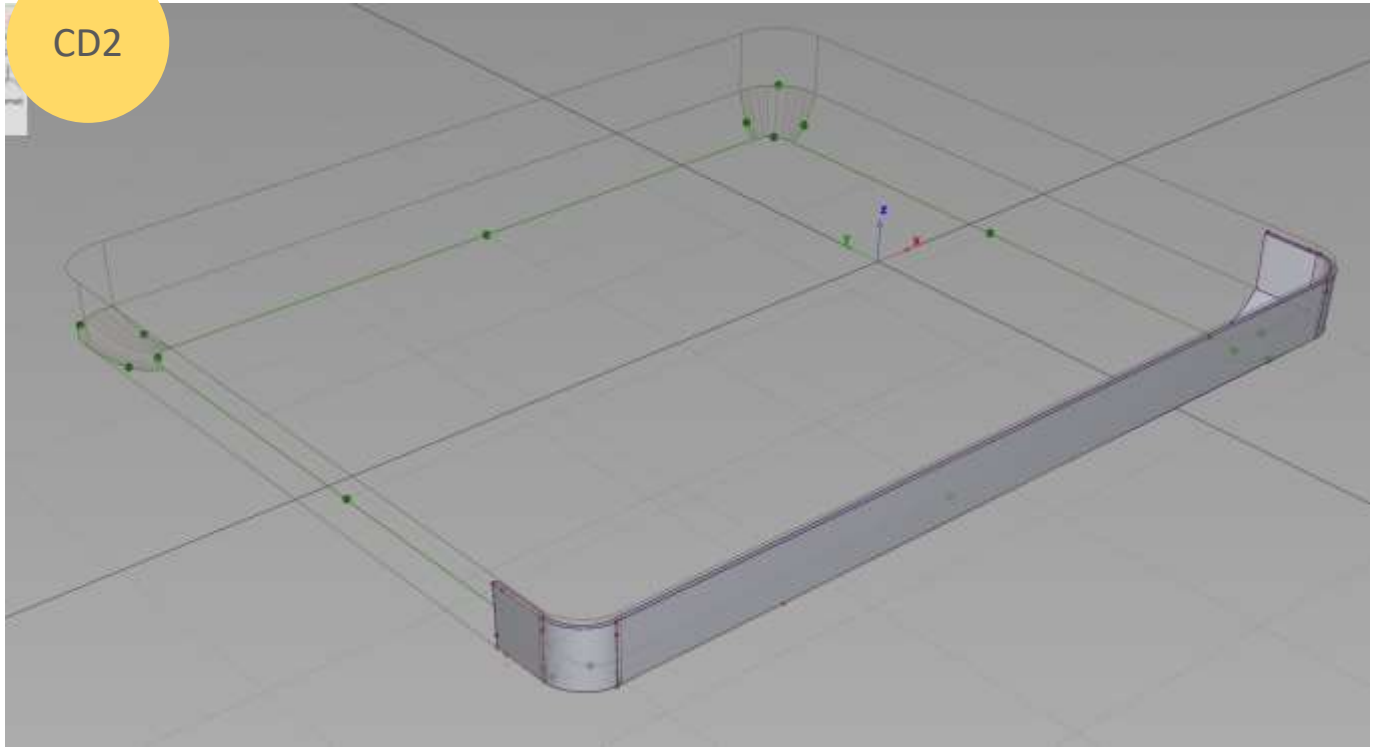
I lowered the base height to be same as Vasari. Also have chamfer gap and .577mm gap (same as Vasari). Front is aligned with Vasari tray-Input...

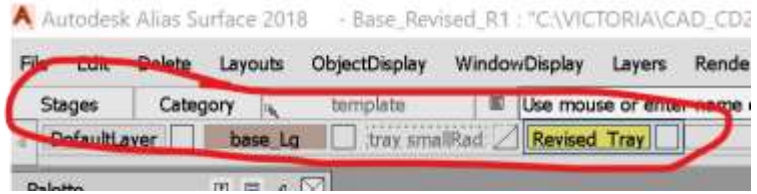


Vertical radii is now smaller – 18mm on outside.
I was able to change vertical radii but lower chamfer is now NOT aligned.
Need to do that in ALIAS – see next pages

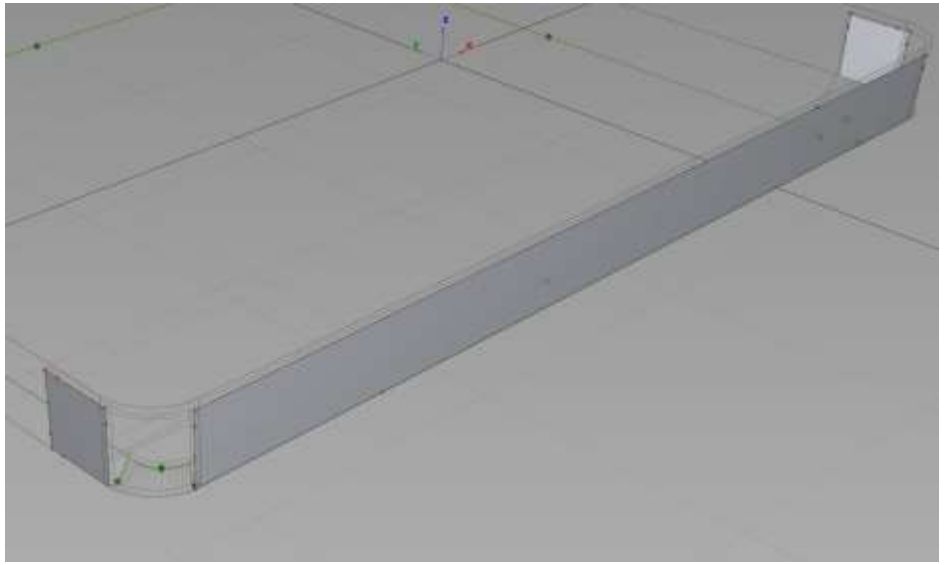
Rebuilding tray-input corner radii – in Alias

CD2





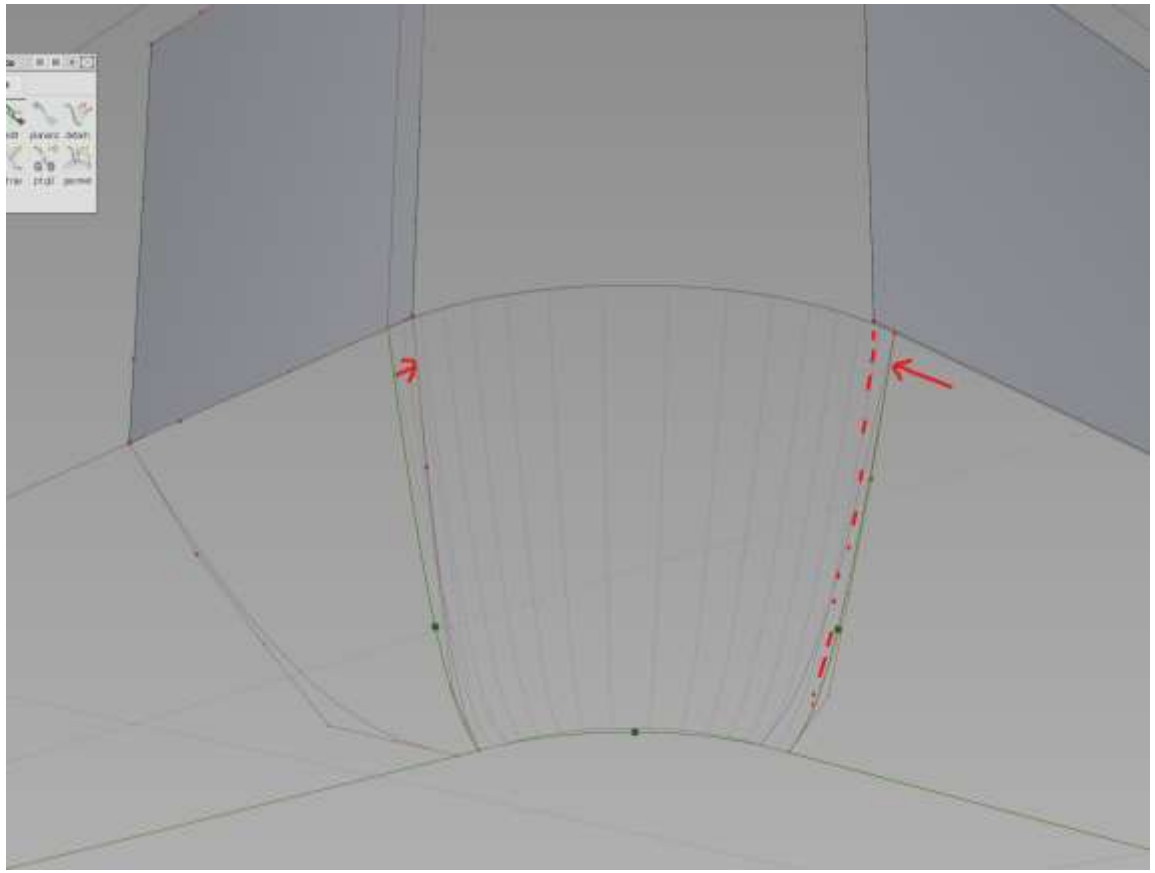
1) Opened previous wire file that created CD1 base.
2) Imported smaller radius new version
3) Moved in forward/Y and can position/align to Vasari in CREO…
4) Models are in THREE different layers…



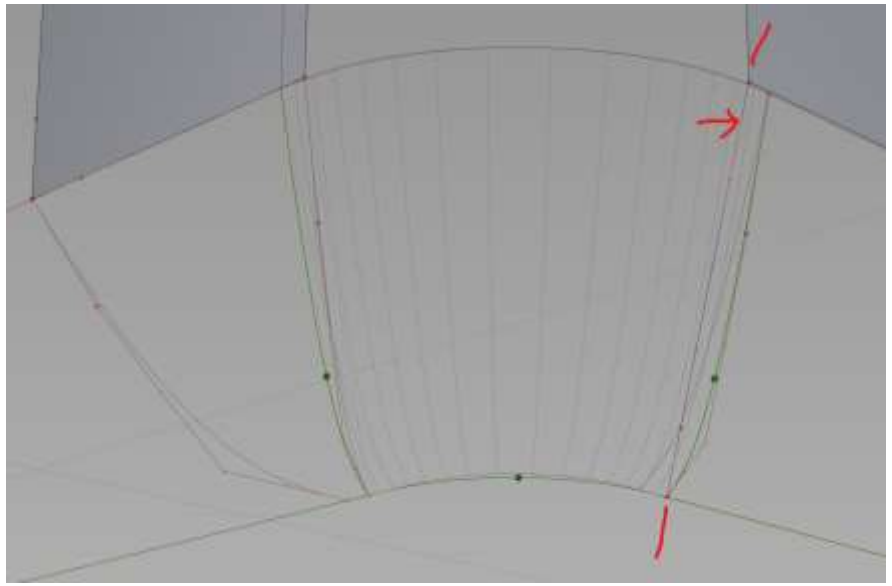
5) Snapped curves to existing straight sides (smaller radii CREO file)

Saved file as Base_Revised_R1.wire – in Victoria/CD2_CAD folder

Rebuilding tray-input corner radii – in Alias



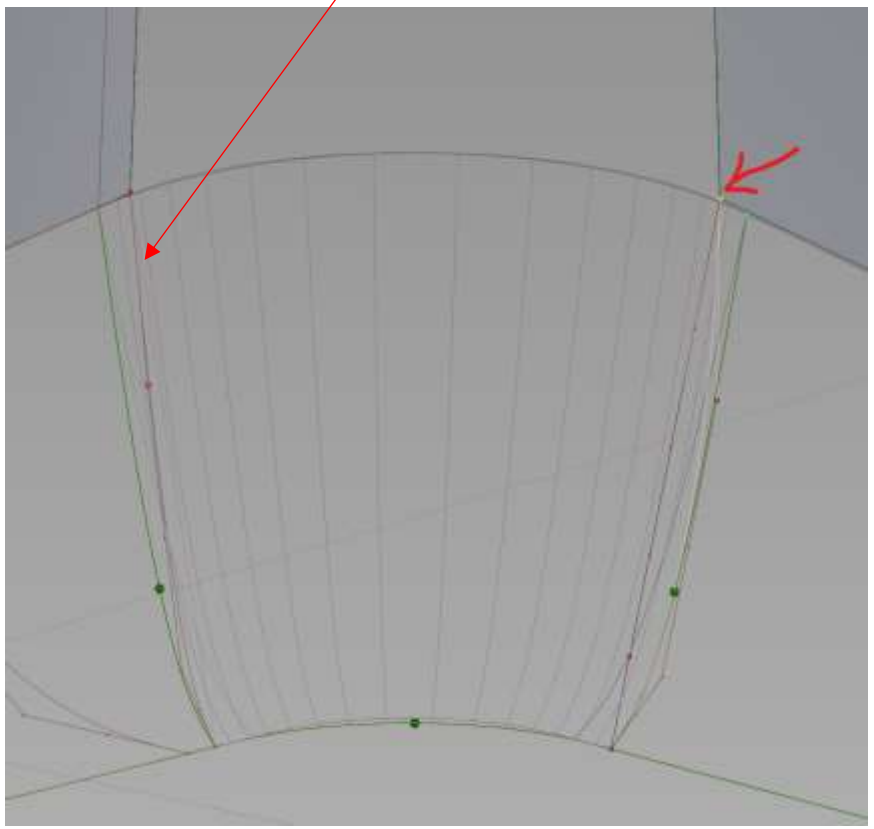
Need to move curve CVs – align with vertical surface above, but keep side geometry and surface aligned/same as previous and current base CAD.



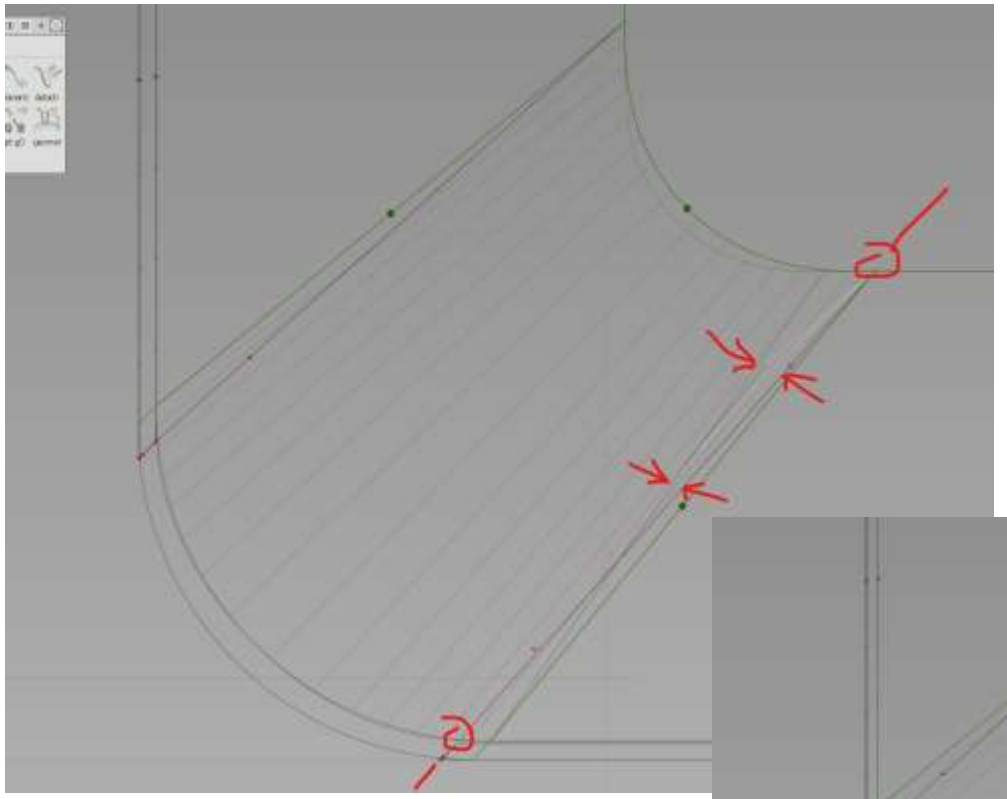
Created straight curve as GUIDE

Rebuilding tray-input corner radii – in Alias

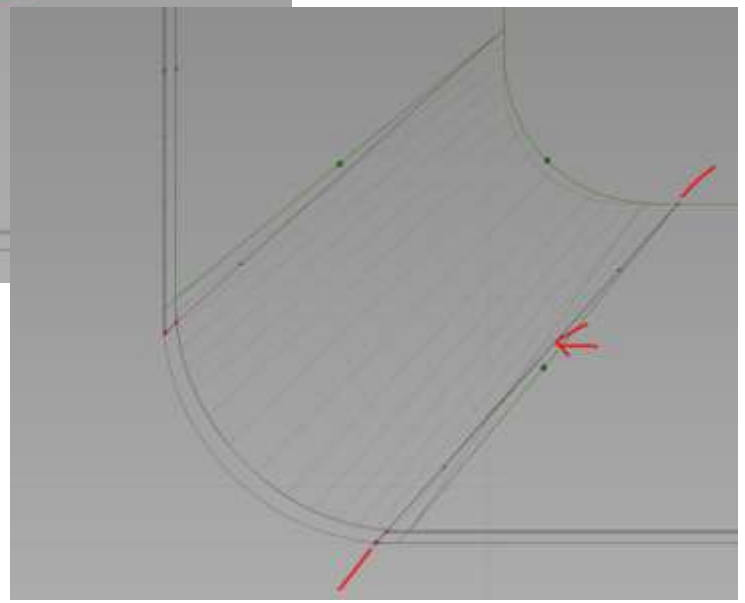
Already snapped this curve end, created straight line from top view ONLY move CVs in Y direction!



Snap curve end to this surface



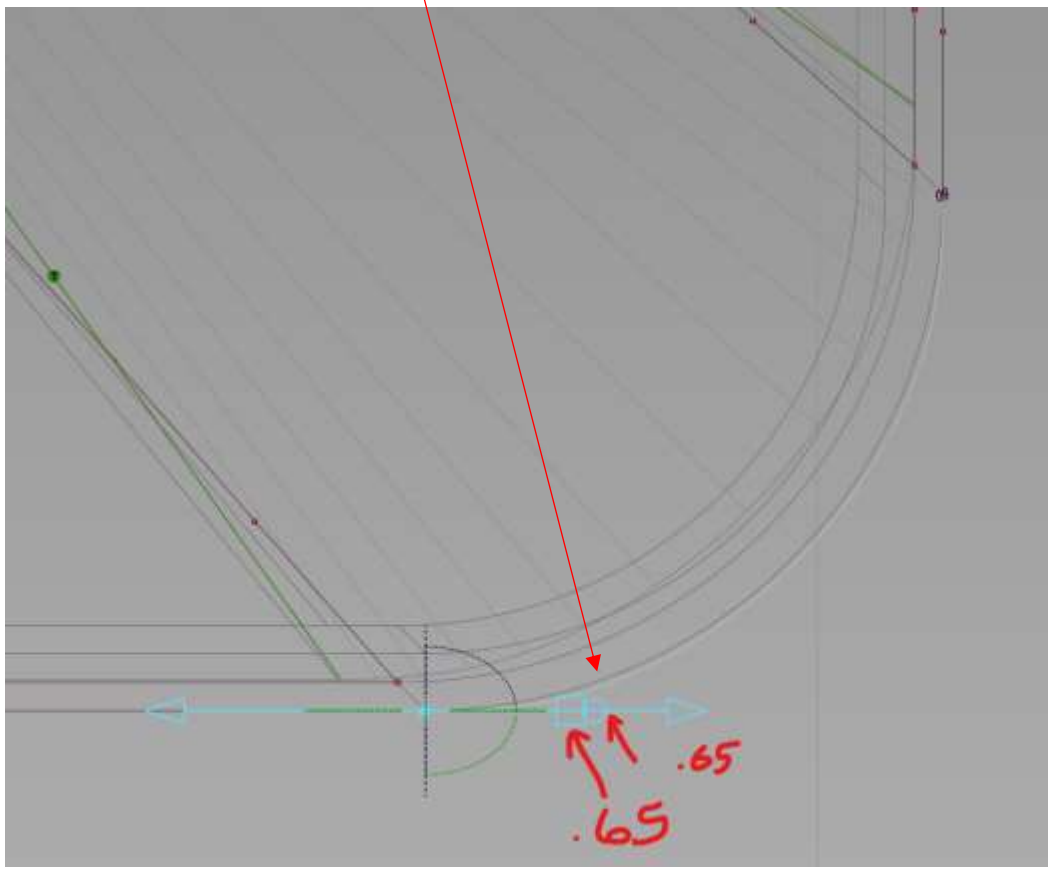
Top view - Move CVs only in X to create straight as possible line.

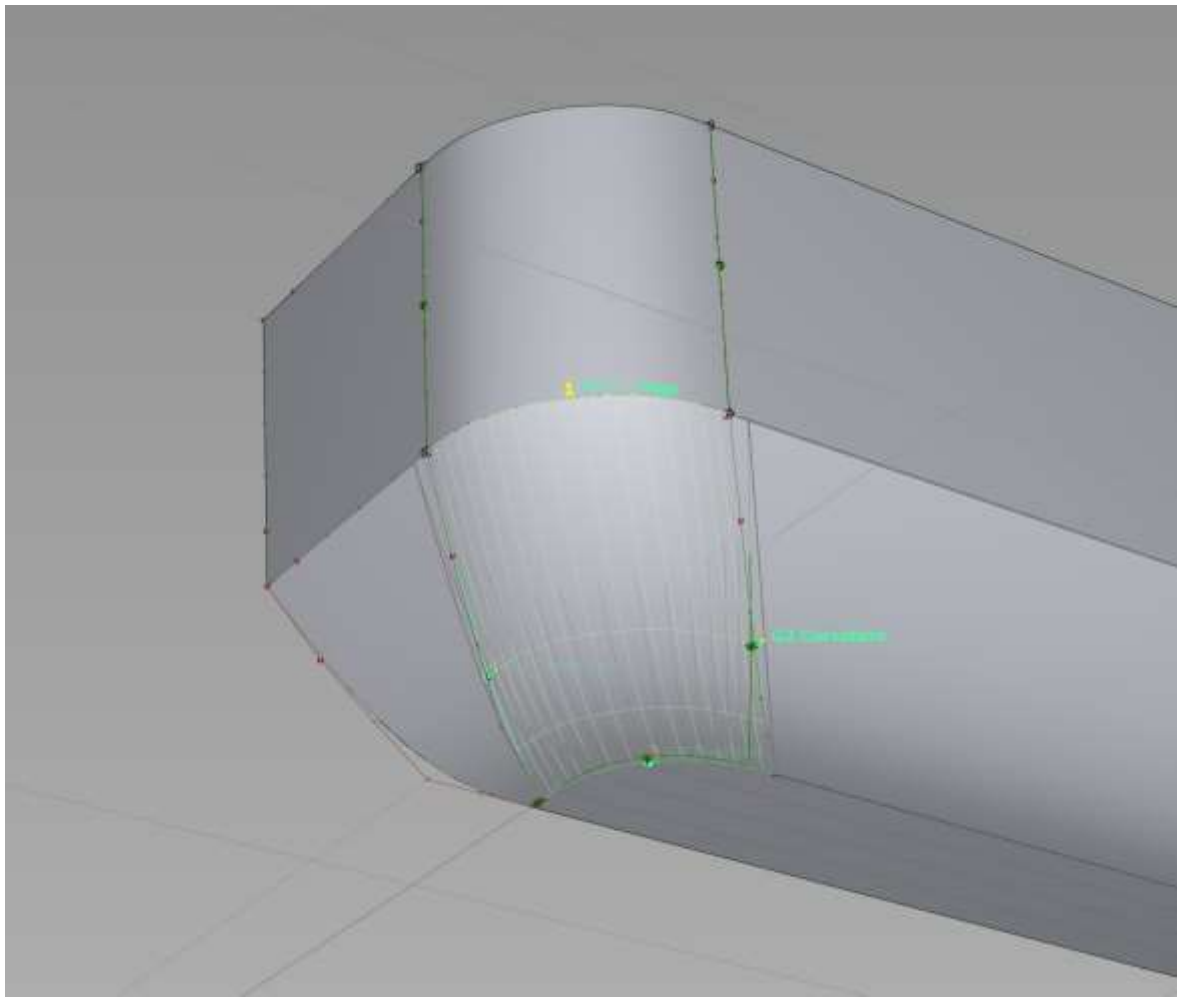


Top view – After – now straight as possible

Rebuilding tray-input corner radii – in Alias

Blend Curve tool – Edit Blend Curve and adjusted .65 for both square and circle adjuster…

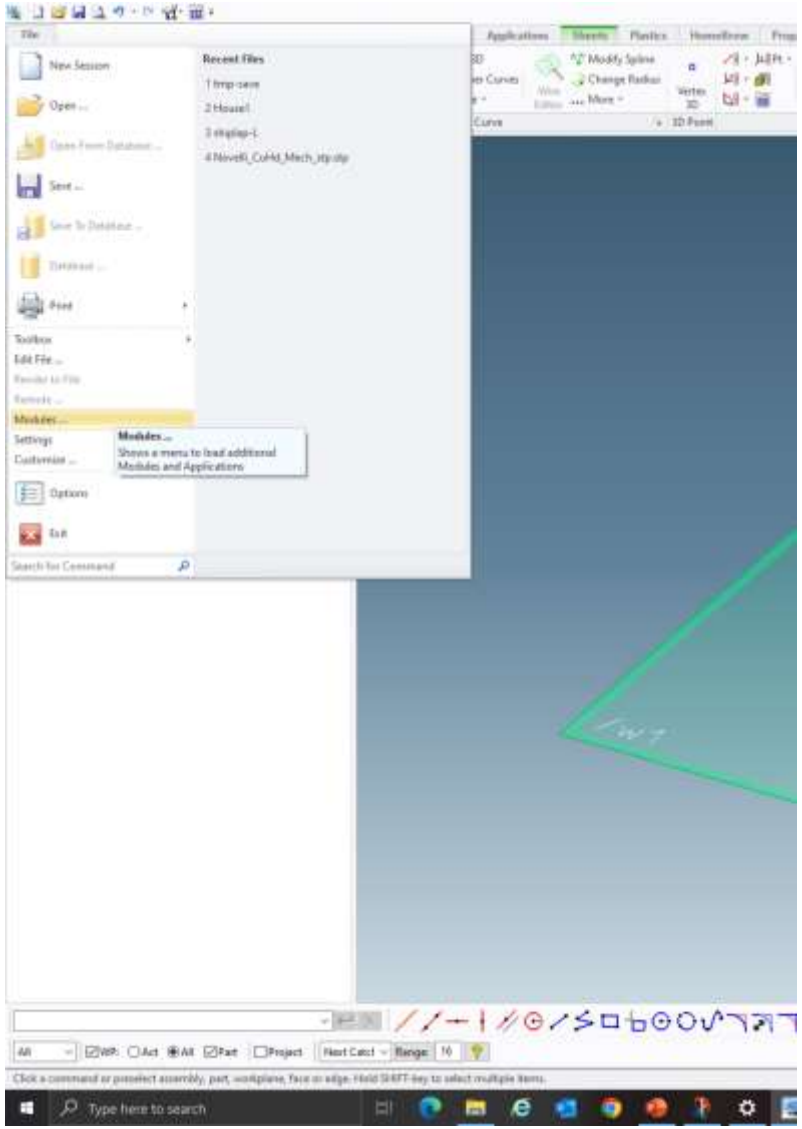




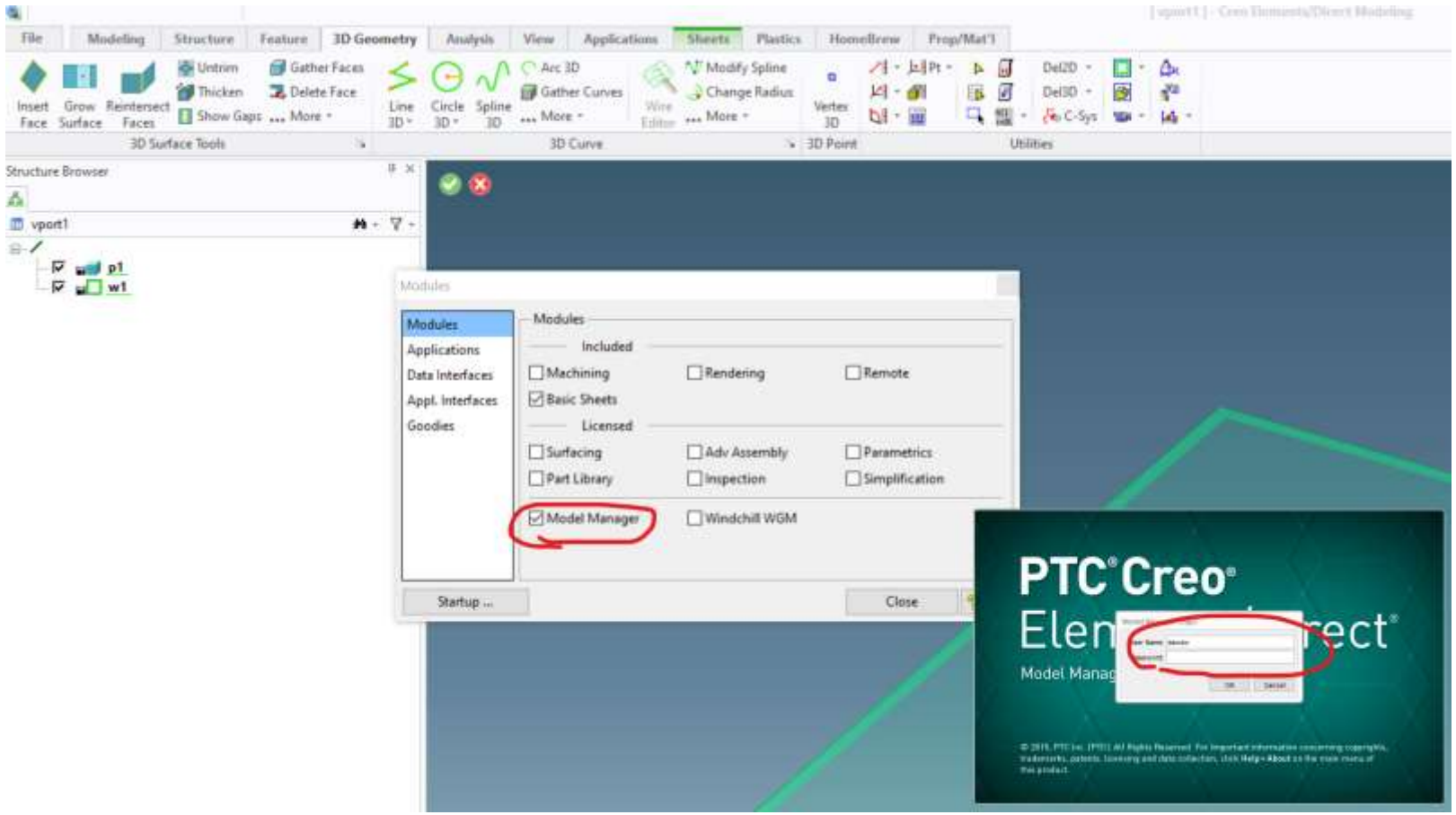
Added SQUARE surfaces with CURVATURE where possible

Model Manager Tips (from Dan)

File > Modules



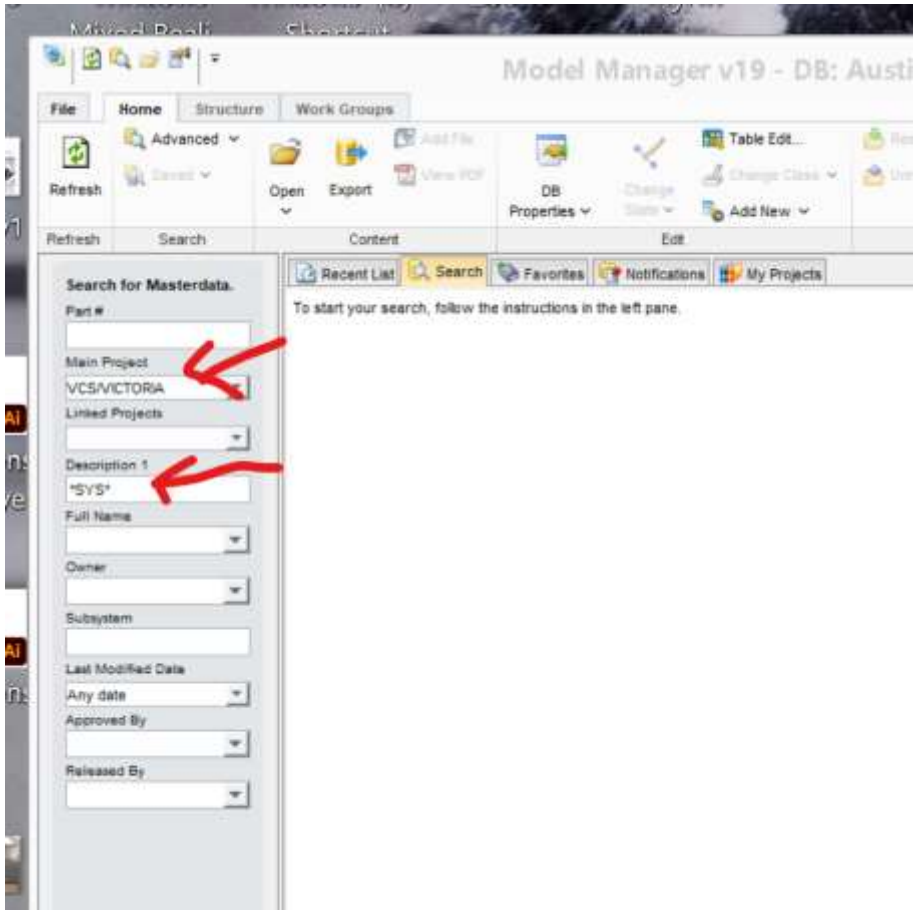
Select Model Manager, then enter your NT password.
If you do not have a modelmanager account, ask Jeffrey Haselby for help

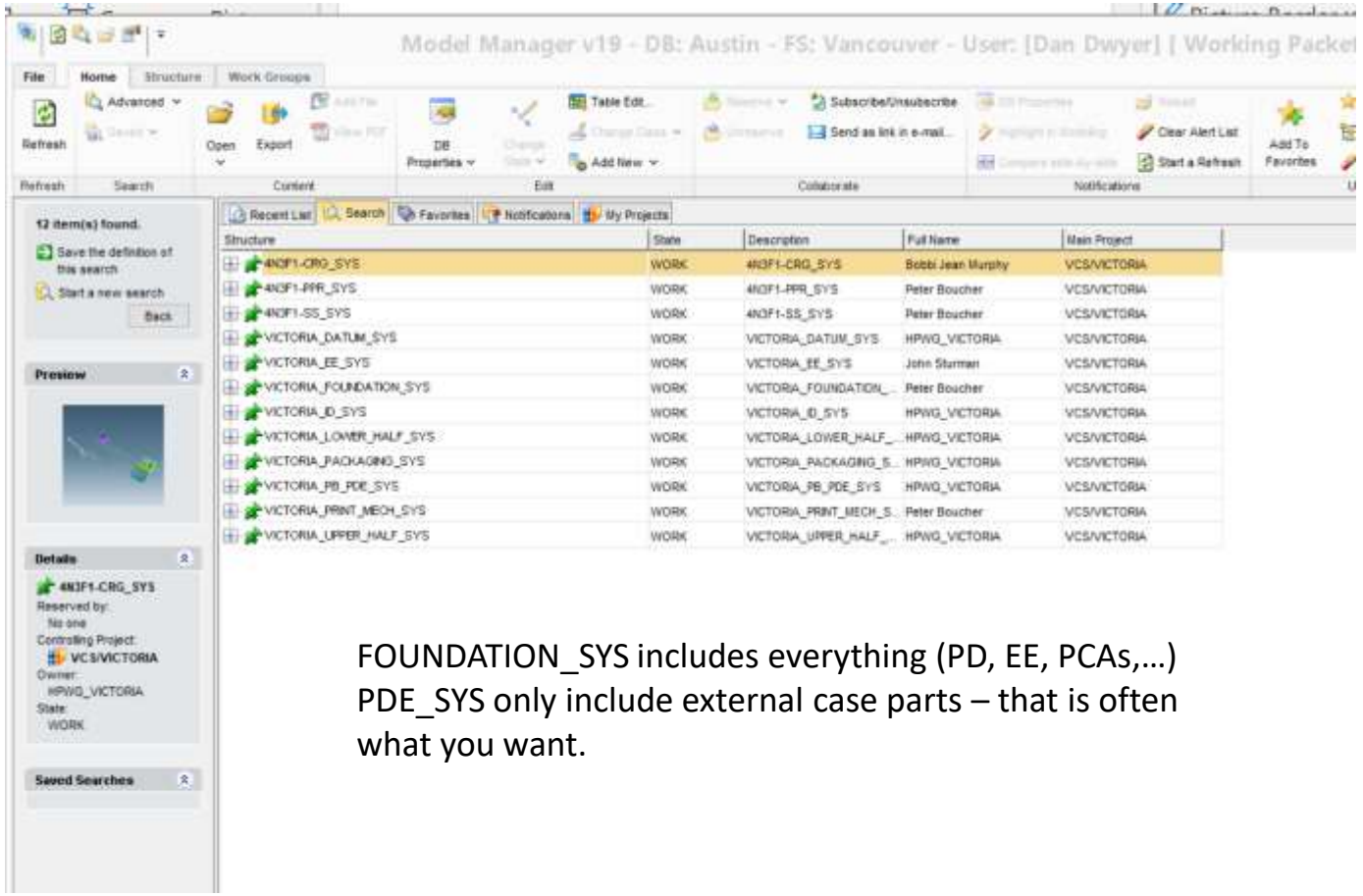


Search for project here
Singapore products are under SGP and Vancouver are VSC.
Some files are/were managed by Boise, San Diego, Corvallis, or Barcelona…

Model Manager Tips

Select Model Manager, then enter your NT password.
If you do not have a modelmanager account, ask Jeffrey Haselby for help

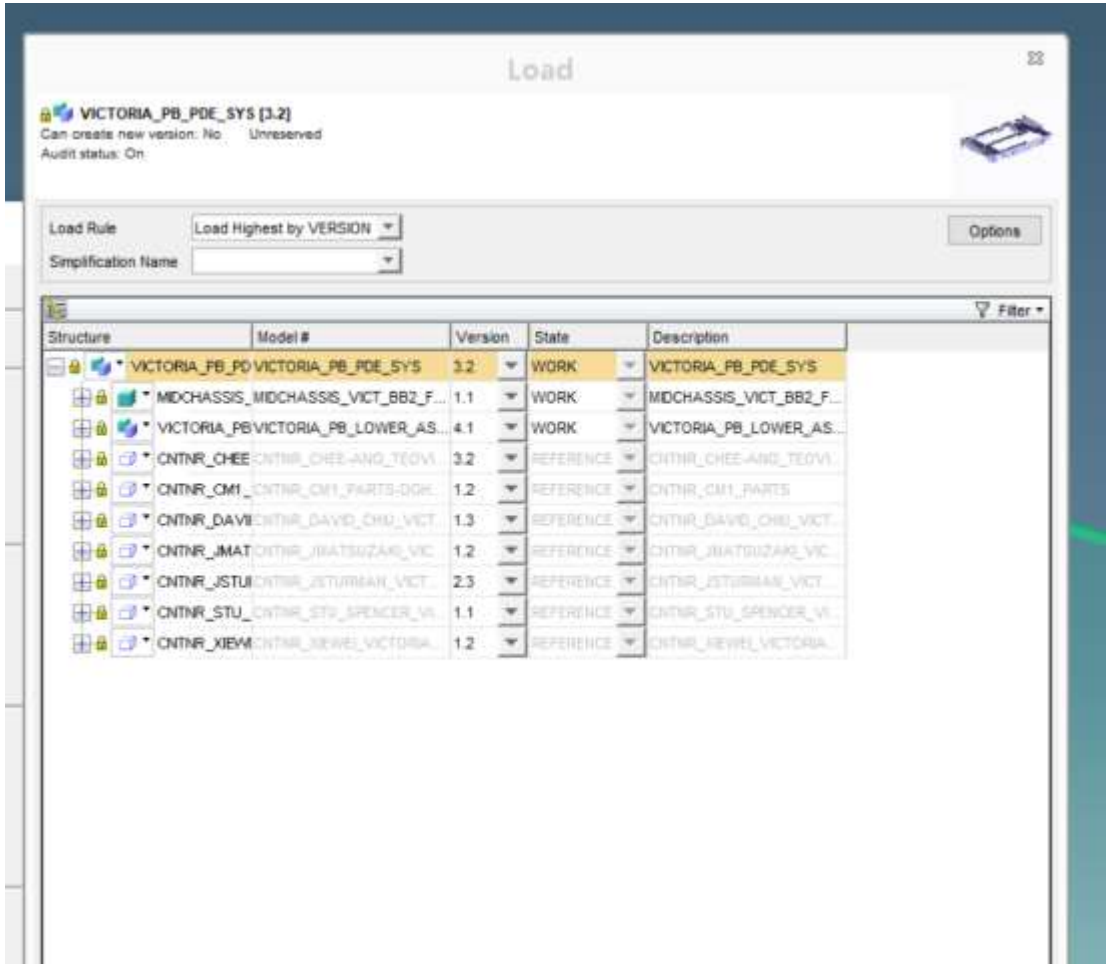


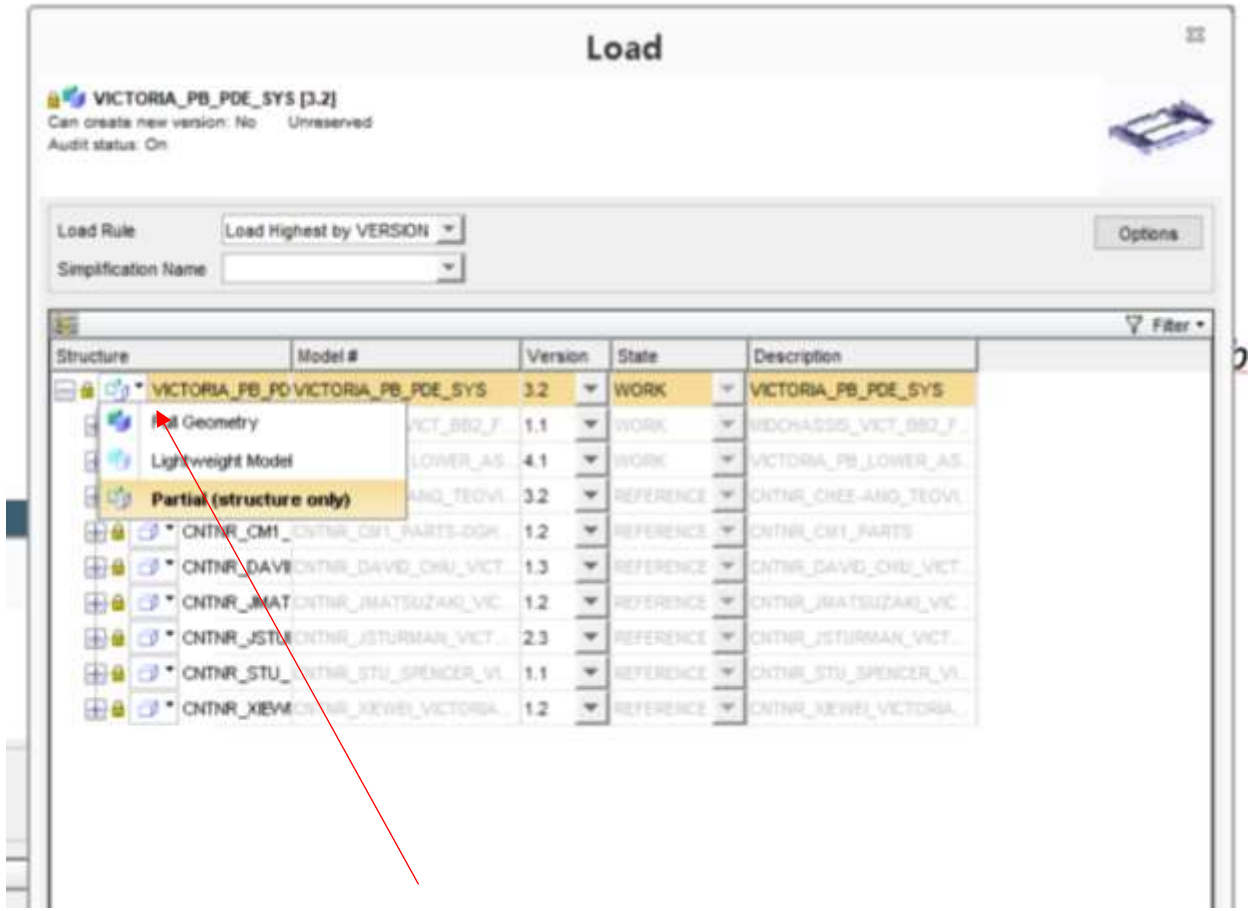


FOUNDATION_SYS includes everything (PD, EE, PCAs,…)
PDE_SYS only include external case parts – that is often what you want.

Model Manager Tips

1) Double click on ASSY
2) Make sure Highest by VERSION is selected
3) The two small boxes show this is a FULL LOAD of all geometry – that can take a while to load. You can load Lightweight or PARTIAL to load the assembly library

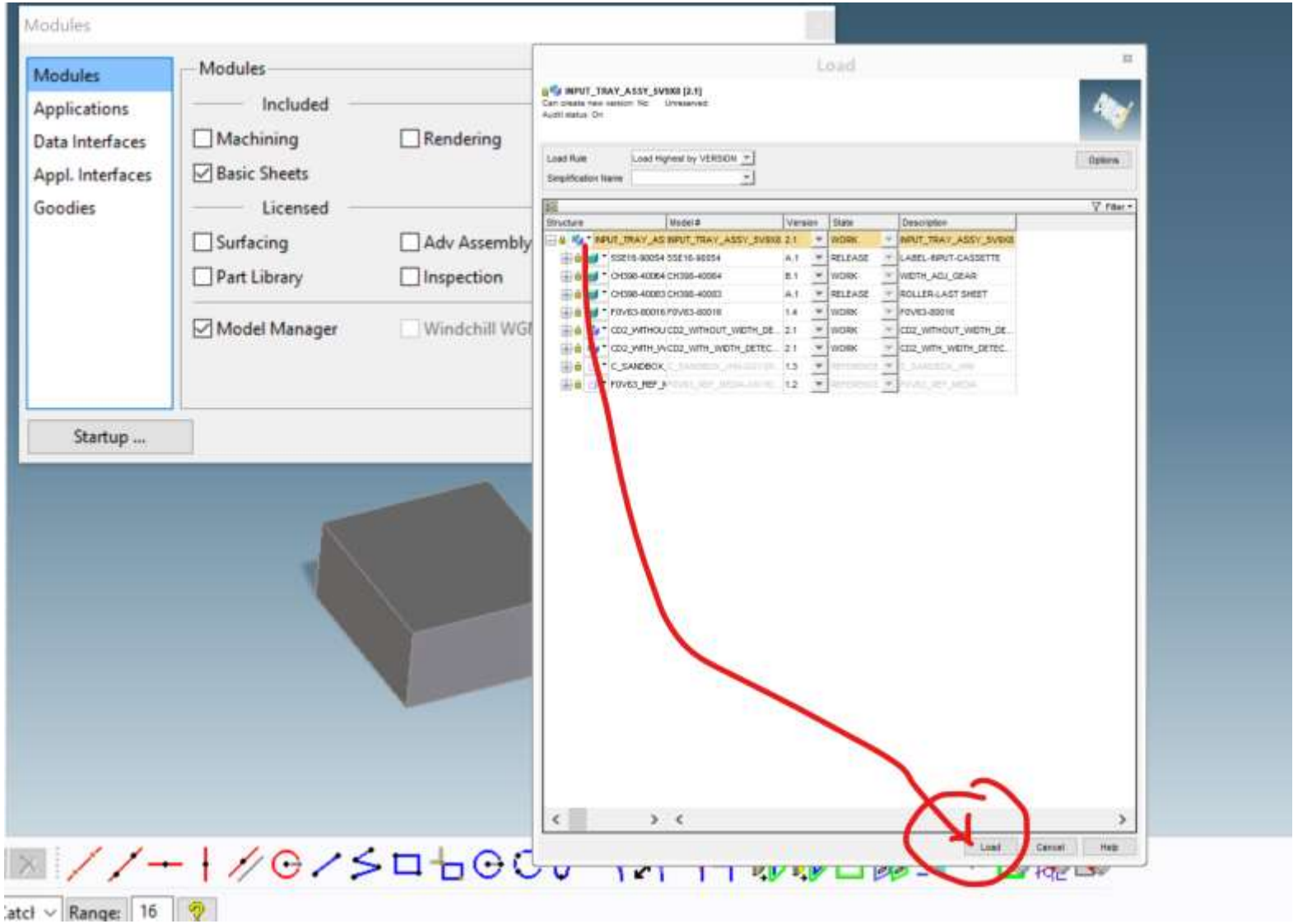




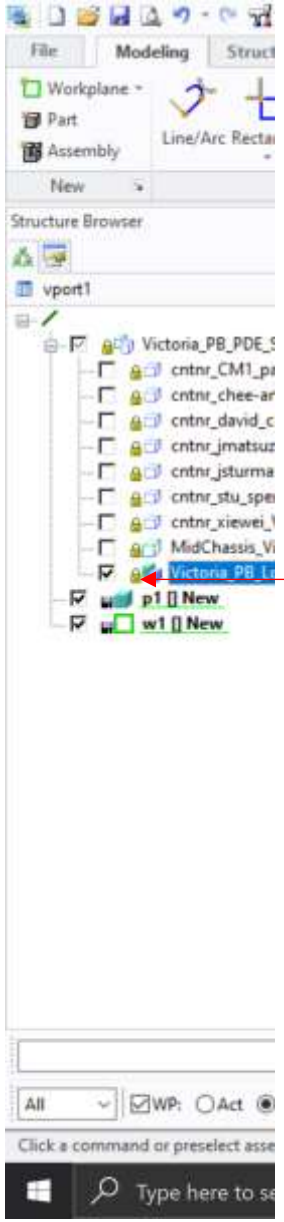
Select Full, Lightweight, or Partial

Model Manager Tips - Preferences

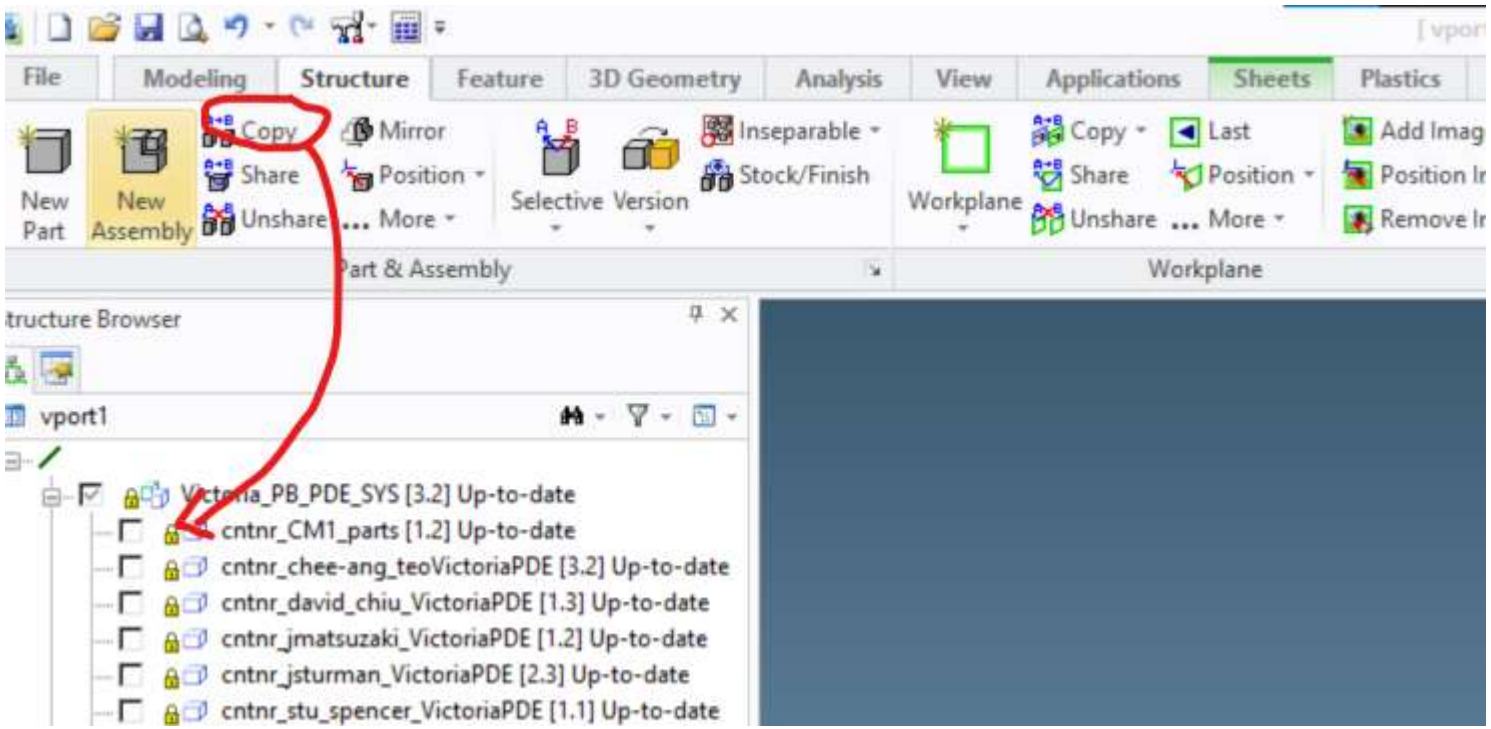
Select Double boxes (Assembly) to load that. If you only load a single part without first loading the ASSEMBLY it may import to incorrect location.
Then click LOAD box…



Model Manager Tips



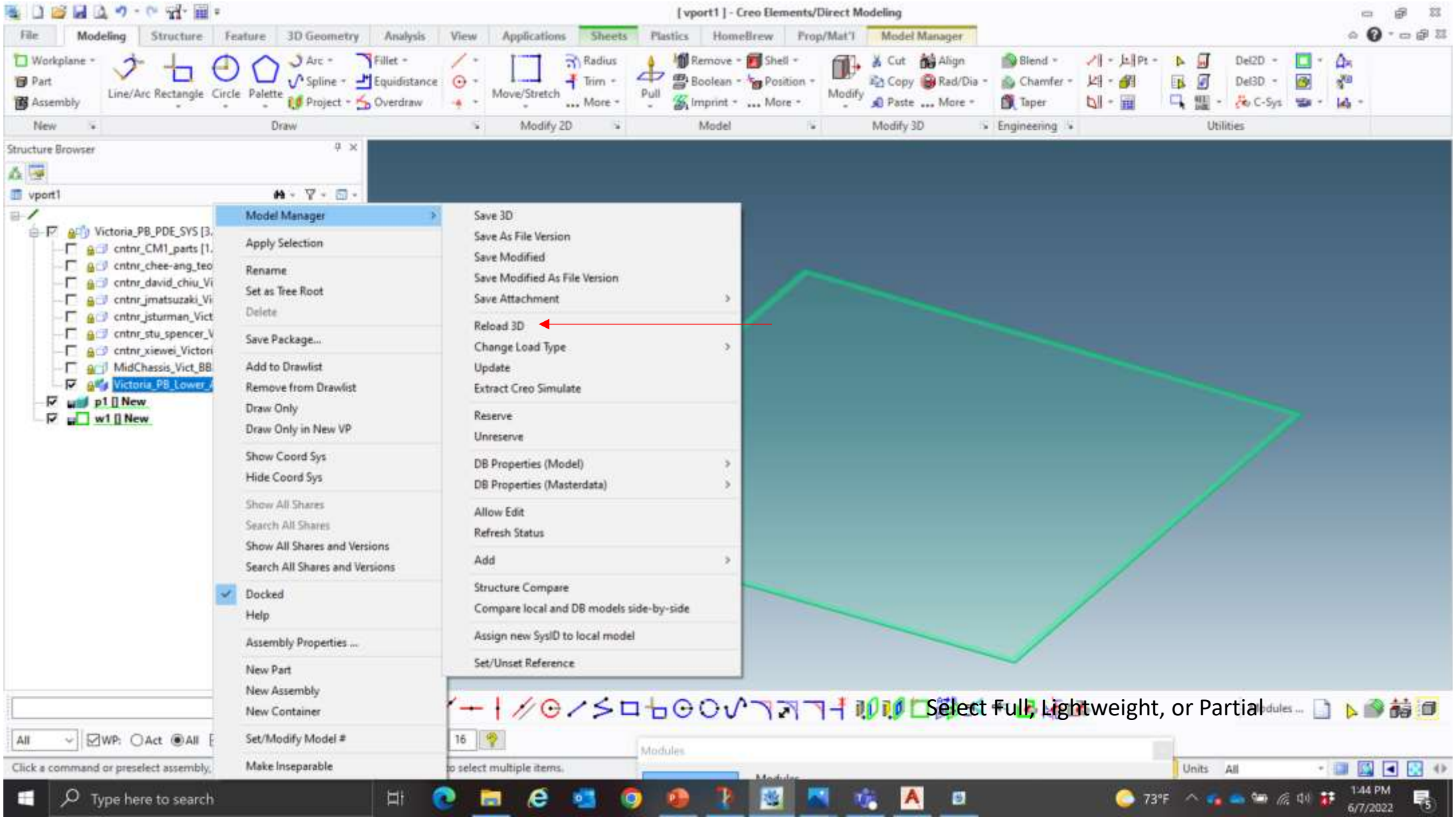
When you load parts and want to modify them on your own/own PC but not in ModelMgr, Make a COPY (See locked icon?) Your copied version will NOT be locked!



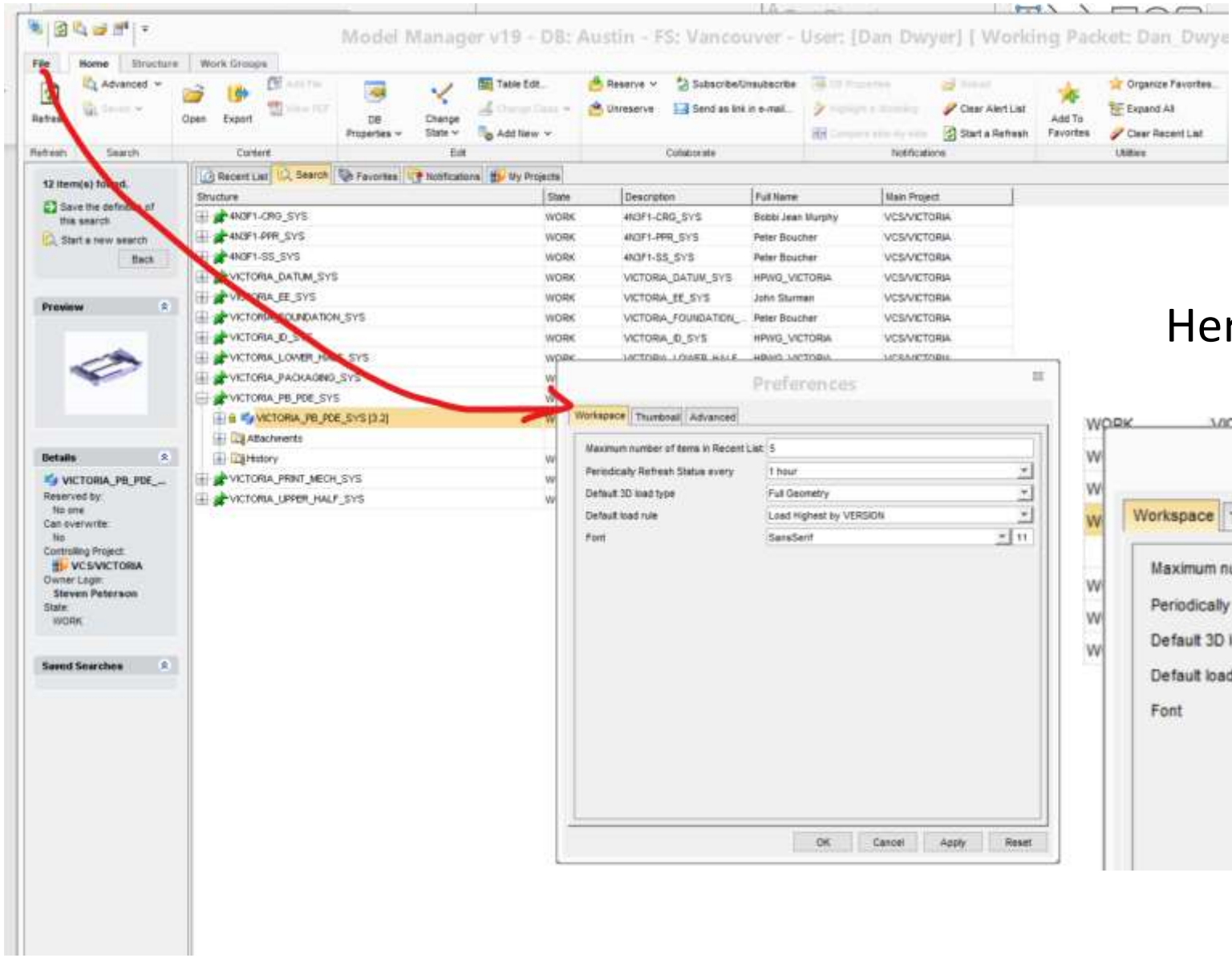
Select Full, Lightweight, or Partial

Model Manager Tips

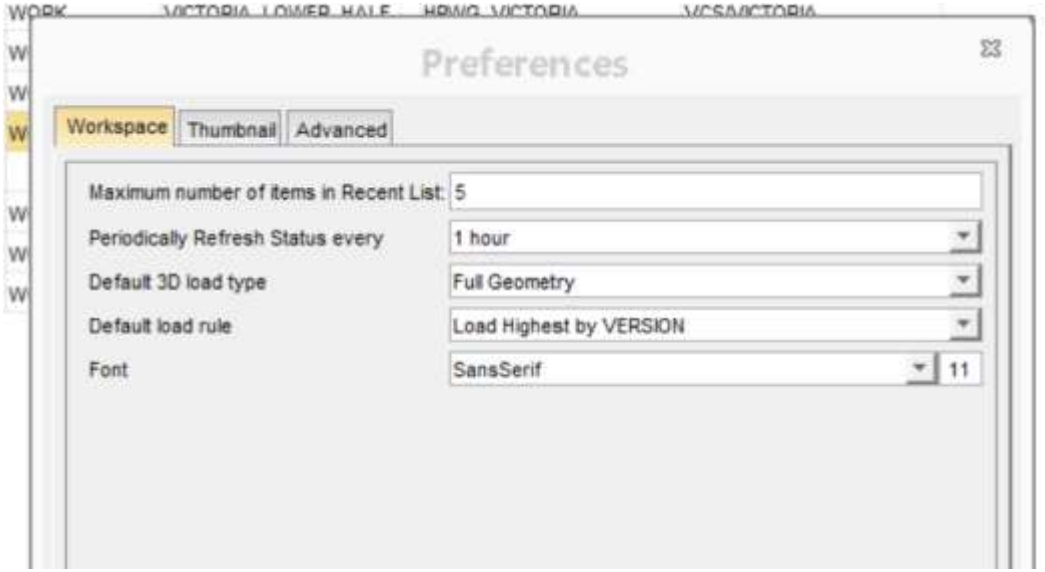
You can reload (update) parts by selecting part in file structure or vertice in drawing window. Then RIGHT-CLICK > Model Manager > Reload 3D



Model Manager Tips - Preferences

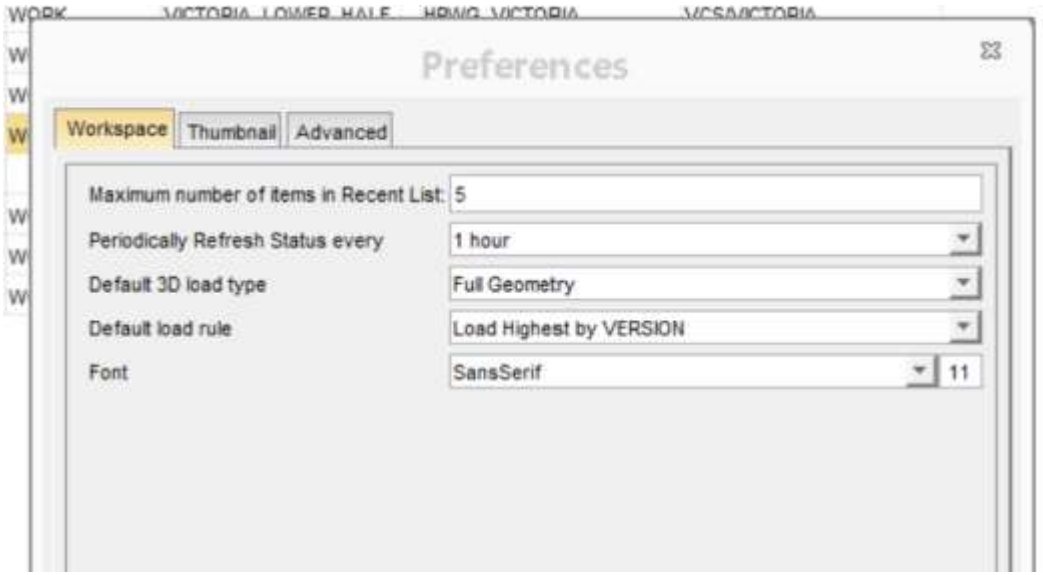


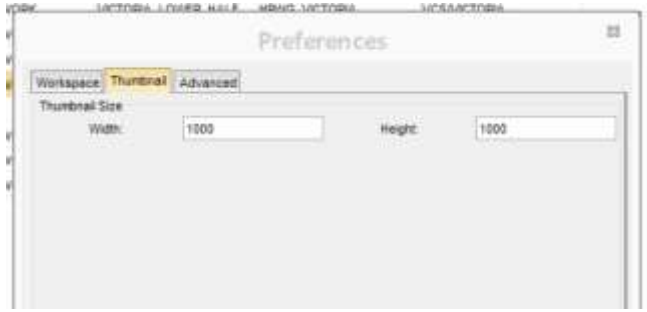
Here are my preferences:

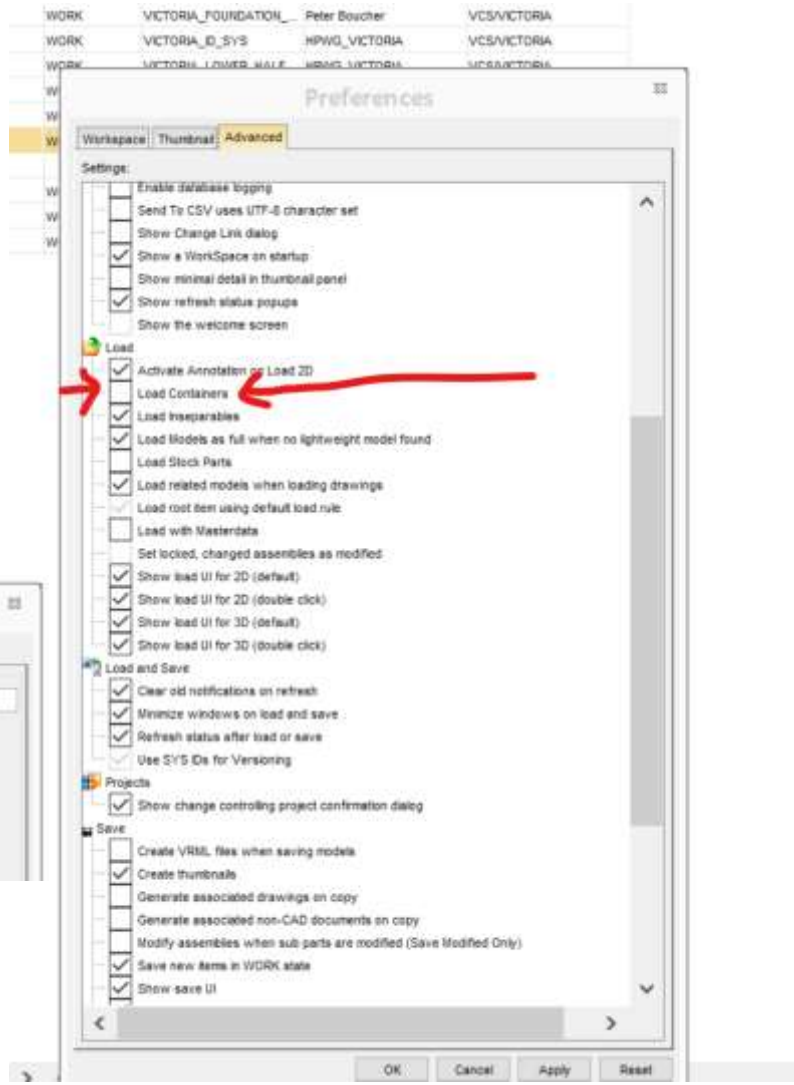


Model Manager Tips - Preferences

Here are my preferences:





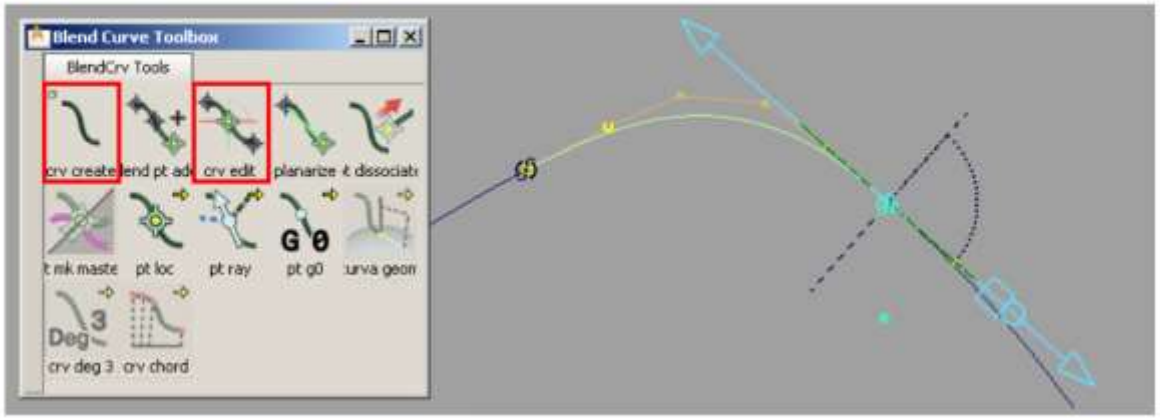


Tips for Working Effectively with Blend Curves

Some people use Blend Curves for every curve they create in Alias, some never use them at all, preferring the basic curves and the Align tool.

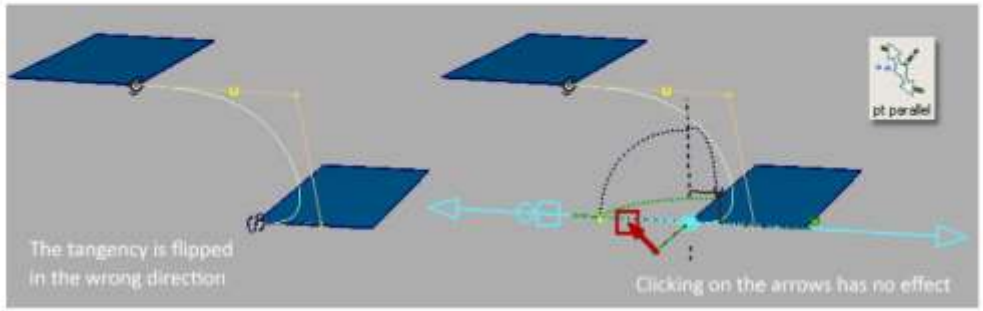
Blend Curves were primarily designed for 'blending', they default to a G2 (curvature) connection to a surface, and they are associative, sticking to the surface as it is moved or manipulated. So most users only use blend curves for creating transitions or blends between other curves and surfaces.

This tutorial presents a series of tips and techniques for using blend curves in this way. I am assuming that you have a basic familiarity with creating Blend curves, and using the blend curve edit manipulator to control their shape and continuity settings.

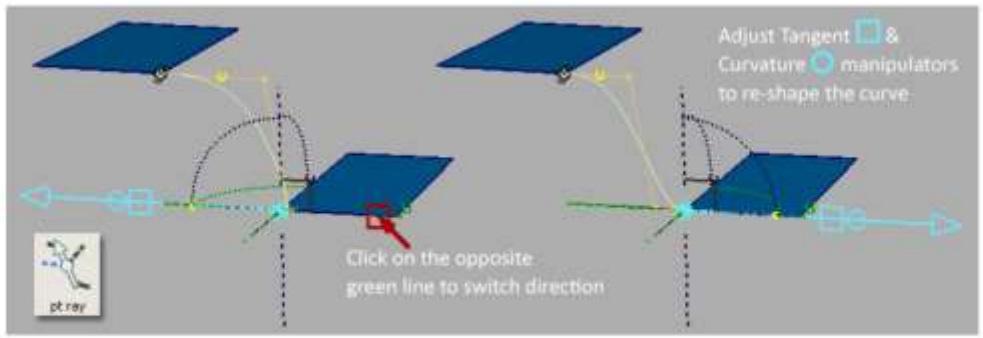


TIP 4: Controlling Blend Point Direction

If two surfaces are close together, the blend curve will sometimes 'flip' in the wrong direction. The default manipulator shows two blue arrows, and these don't allow you to flip the end of the curve.



Switching to the 'single arrow' manipulator allows you to change the direction:



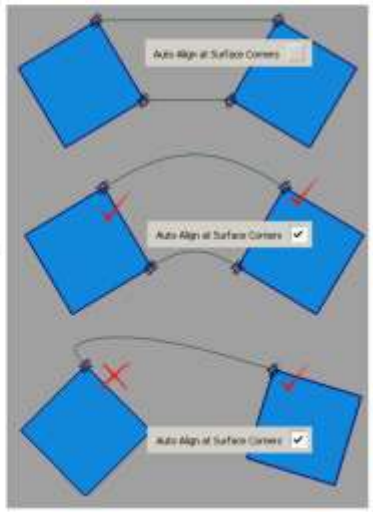
However it also changes the CV distribution along the curve, which you will need to adjust using the Tangent and Curvature manipulators. This is why I generally stick with the double-arrow default unless I have problems.

TIP 5: Using Auto Align at Surface Corners

The 'Auto Align...' option is set in the Create Blend Curve option box.

This will attempt to automatically align the manipulator when you place a blend point at the corner of a surface. Mostly it works really well, but sometimes it can 'guess' wrong and align to the wrong direction. Always look at the flow of CVs to check the alignment.

Turn this option off when you want to allow the Blend Curve to be free to find the most natural blend between two points.



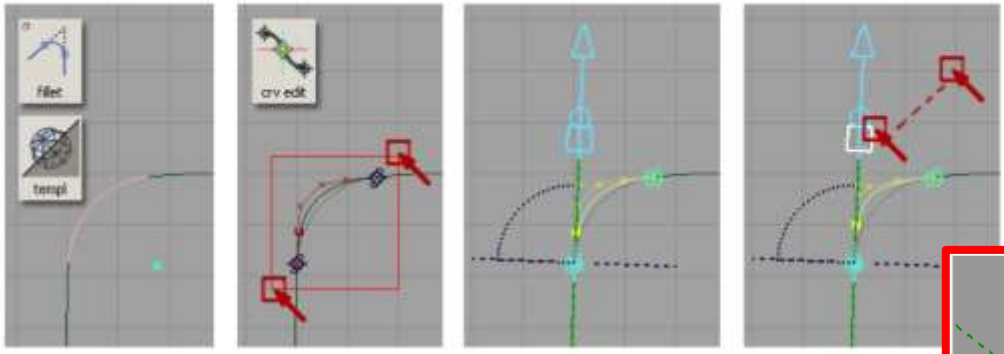
Choosing 'Auto Align' will automatically line up the blend curve to the edge of the surface.

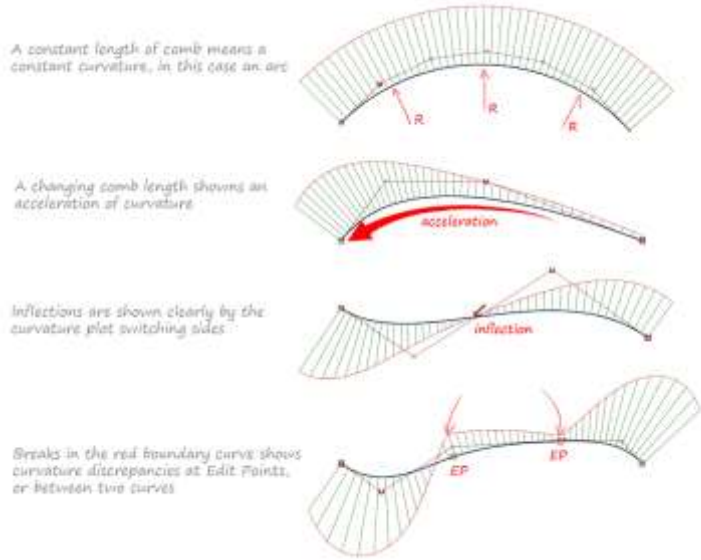
Beware, sometimes the alignment will choose the wrong direction, so you will have to correct it .

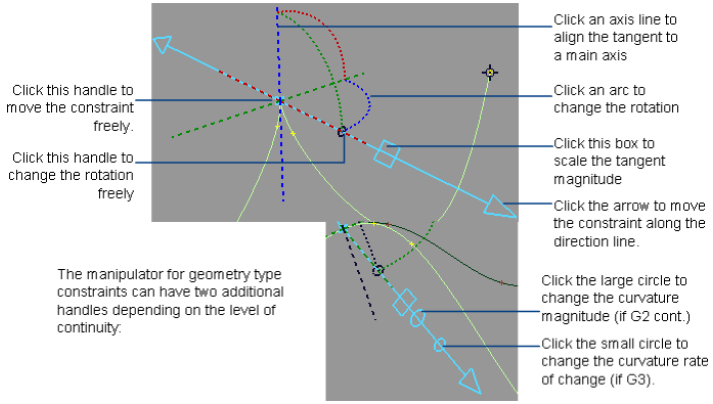
As with normal NURBS curves, use the **Locators → Curve Curvature** comb plot to analyse and design the curve.

TIP 6: Use Both Manipulators Together for a Balanced Curve

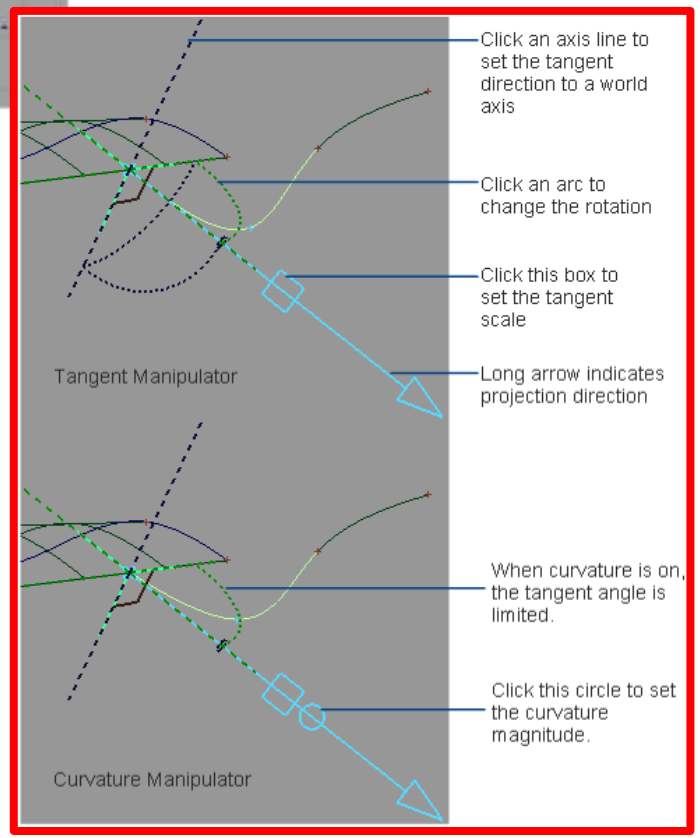
A common use of blend curves is to replace a fillet with a softer transition. Selecting both manipulators at once only displays one manipulator, but modifications to the tangent or curvature controls will affect both blend points equally:







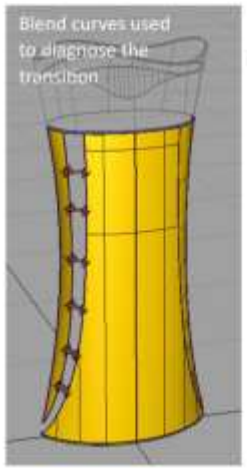
The manipulator for geometry type constraints can have two additional handles depending on the level of continuity:

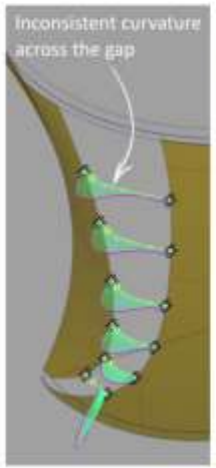


TIP 7: Using Blend Curves to Design a Transition

With this technique I'm not using the blend curves to build surfaces from, I'm using them as a diagnostic tool.

If I am having problem with a Bi-Rail surface (for example) giving me a bad result, the problem may be with how my primary surfaces are set up. Using natural blend curves (without modifying the manipulators) at many points along the transition area can provide valuable diagnostic information. I won't use these curves to build from, I'll just discard them once the problem is ironed out.

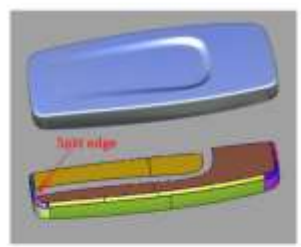


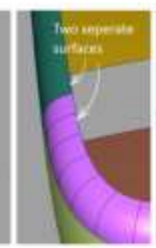


TIP 8: Using Blend Curves to Accurately Trace a Line

In this example, one end of a Bi-Rail can't cross a split surface. One approach is to replace the two surface edges with a single line, and use that to create the bi-rail, (checking the surface continuity afterwards to see if it is acceptable).

Blend curves can be used to create a single curve that accurately matches a series of edges (or Curves-on-surface). Snap a new blend curve to evenly spaced locations, and make each blend point only G1 (tangency). Use the manipulator to align each blend point to the edge surface.



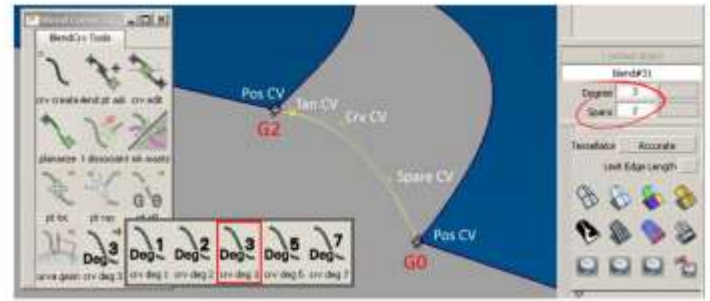


Use the Locators > Deviation > Curve-to-Curve tool to measure the deviation of the curve, and move the blend points along the curve until you are within tolerance. Judging how many blend points will be needed will take some practice, but you'd be surprised how easy it is to reproduce a good quality curve that can be used for building accurately.

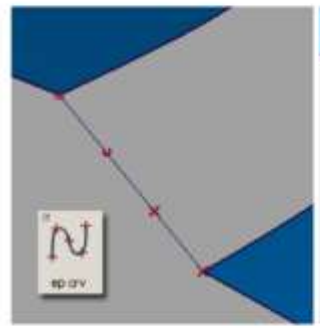
TIP 9: Don't always use Blend Curves!

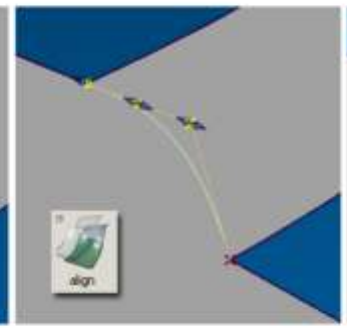
So, are blend curves always the best option to use? They are certainly efficient and I will use them for most blending situations. However, it is important to be able to use alternative methods for blending, particularly the Align tool, as there are some situations where Blend curves don't always give the best results.

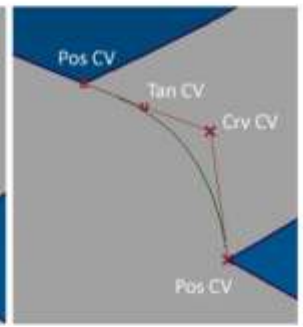
For example, if you want to have G2 continuity at one end and G0 at the other. You should only need a degree 3 curve with 4 CVs to achieve a good controllable result. However, choosing degree 3 for the blend curve results in a two span curve, giving one unnecessary CV.



You can achieve a better, smoother result by creating your own curve with exactly the number of CVs you need, and using the Align tool to set up the continuity.



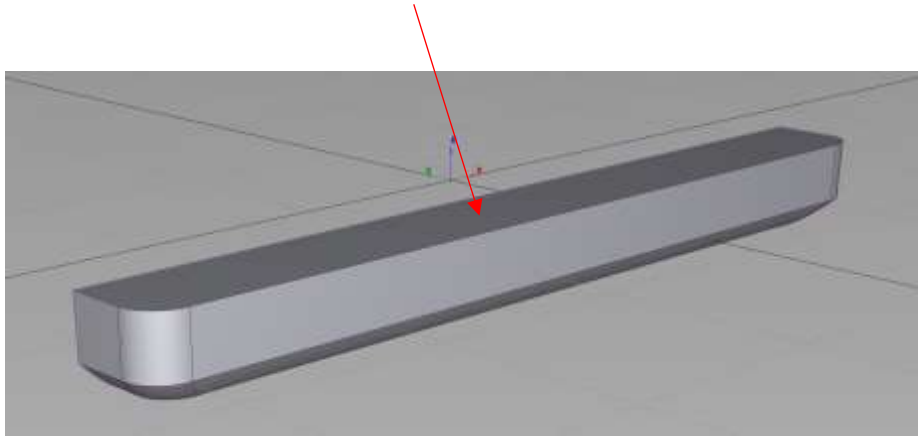


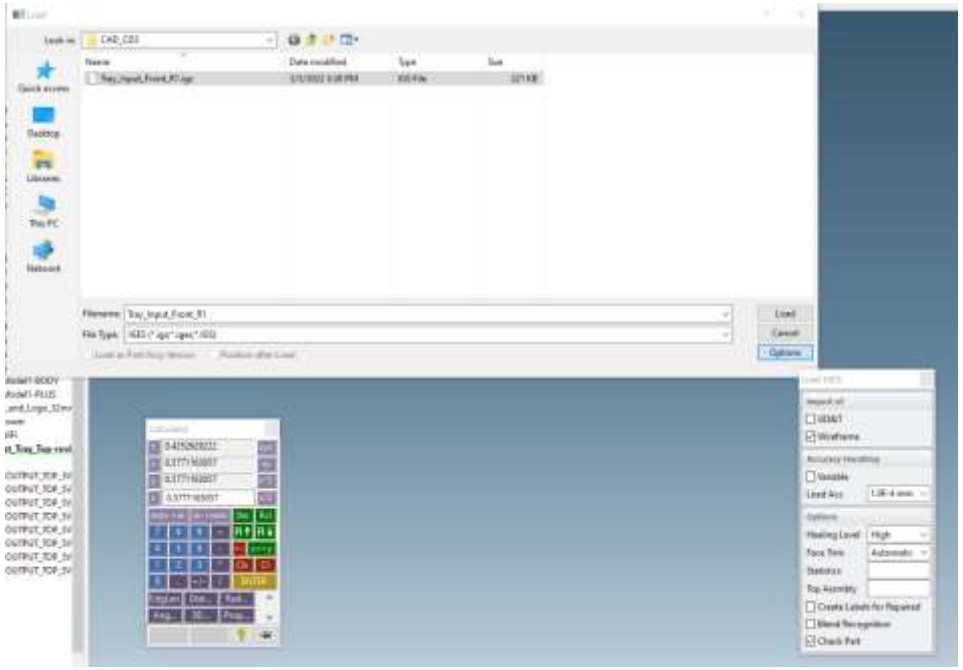


Many technical surfacers doing A-class modeling also prefer the direct control of the Align tool over the more indirect control you have with Blend curves.

Rebuilding tray-input corner radii – in Alias

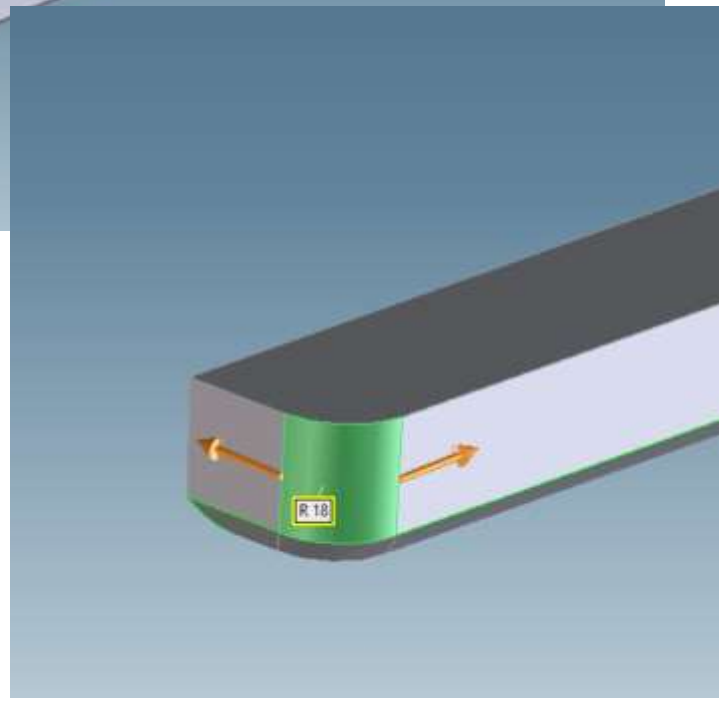
Capped open sides with PLANAR SURF TOOL – the stitched solid – export as iges Tray_input_front_r1.wire





Proper Geo Resolution

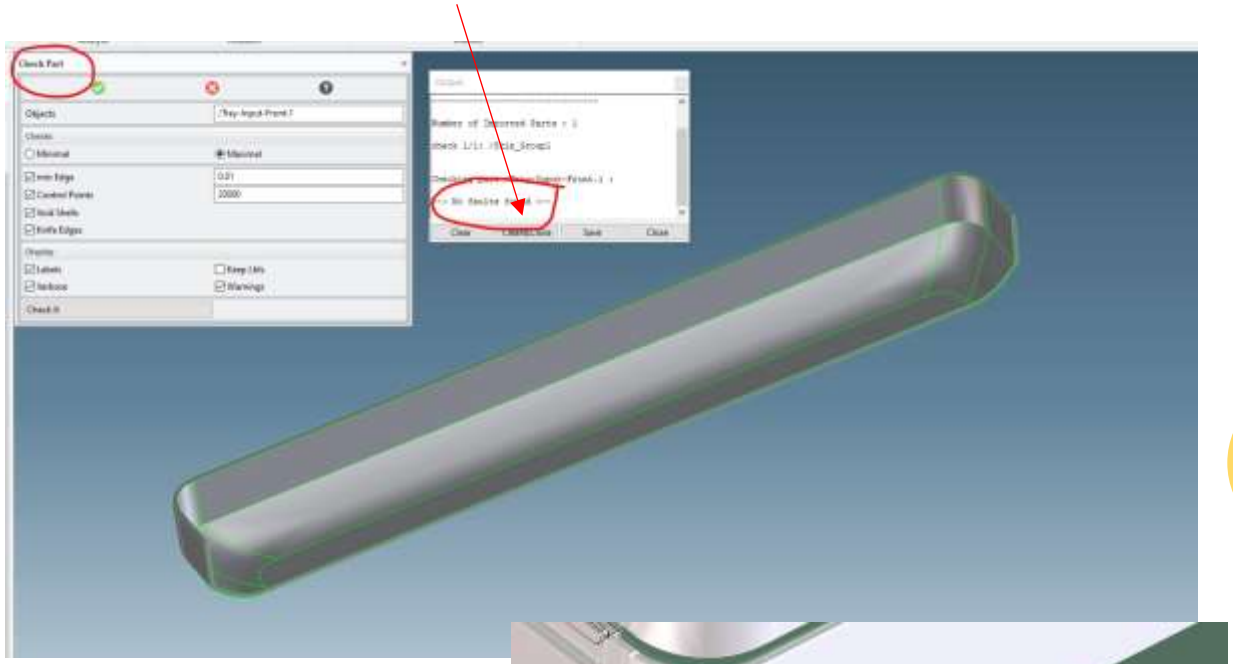
Recognize Blends on this part, then change vertical radii to R 18mm



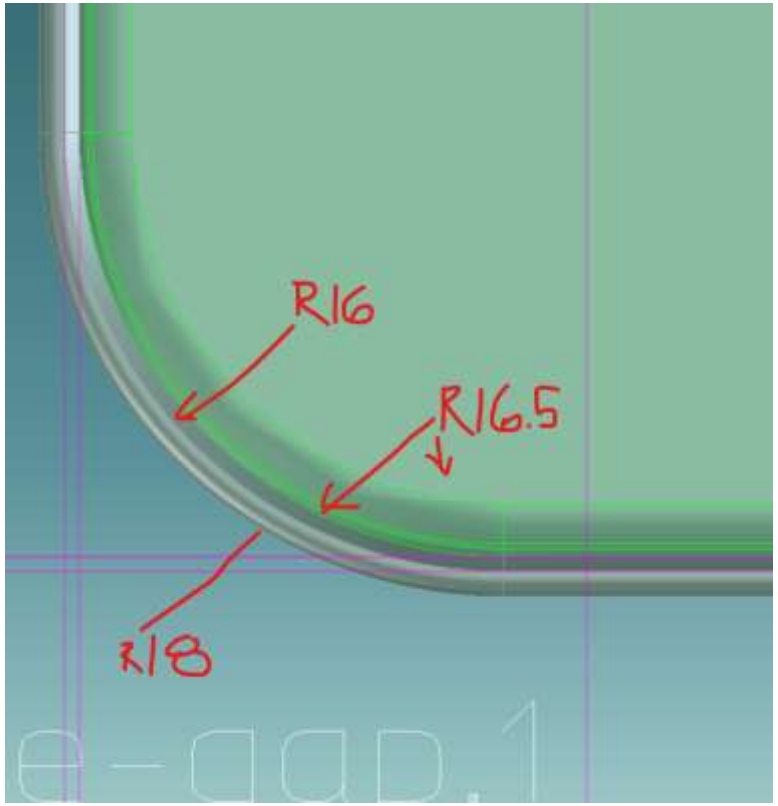
CD2

Rebuilding tray-input corner radii – in Alias

SHELLED part at 2mm thick. Front is drafted same as Vasari…



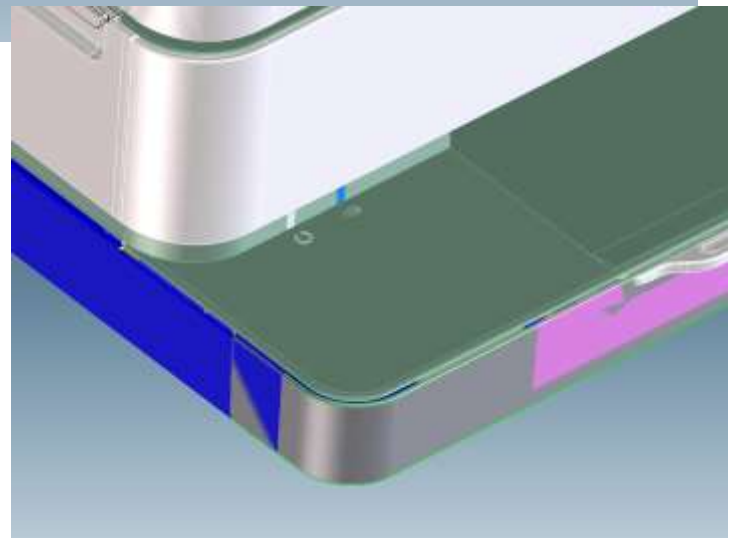
Vertical Radii – Tray-Output part radius is 16.5…



CD2

Base part modified from MM

Pink part in front shows Vasari – aligned surfaces…



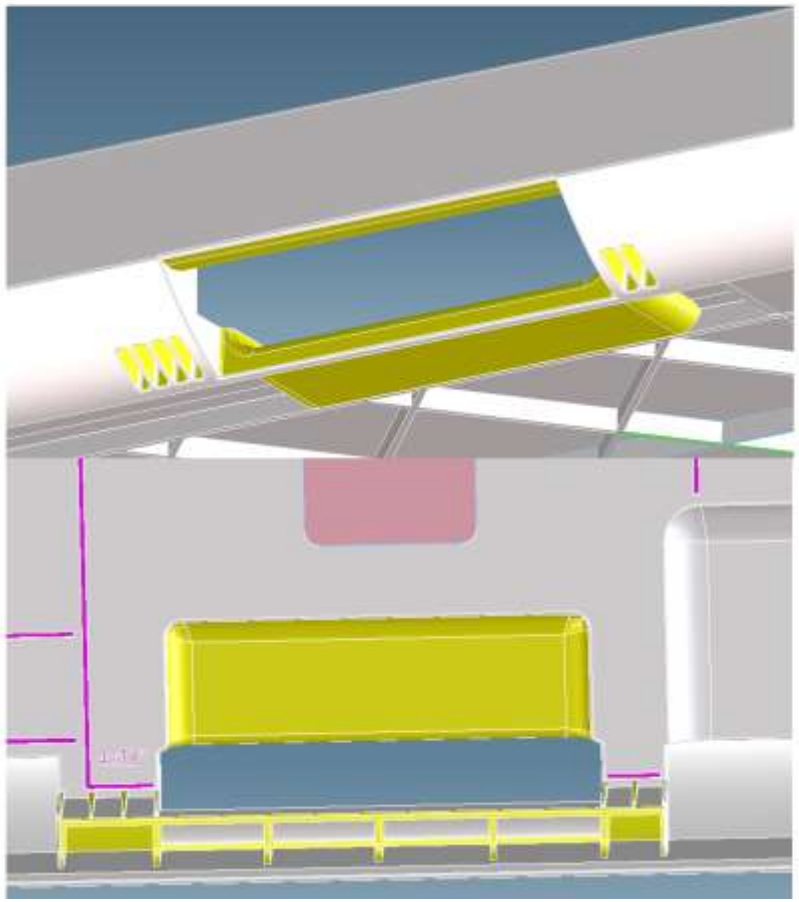
Shorter input tray for CD2

Hi Joel (John, and Peter),

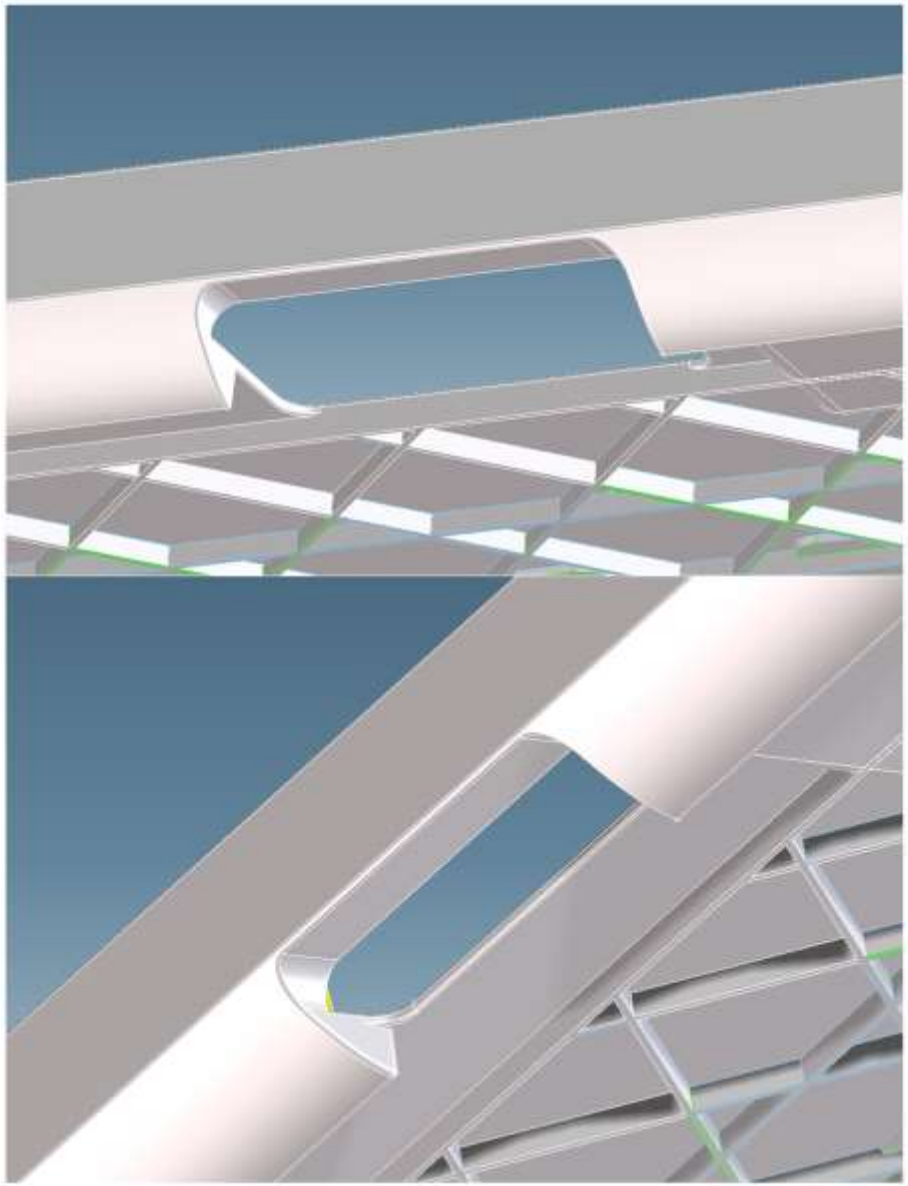
Thanks for the input tray revisions. And showing MM location!

I would prefer to keep the handle less cluttered and radiused as previous version. There is a lot going on in the handle and handle to scoop area on top...

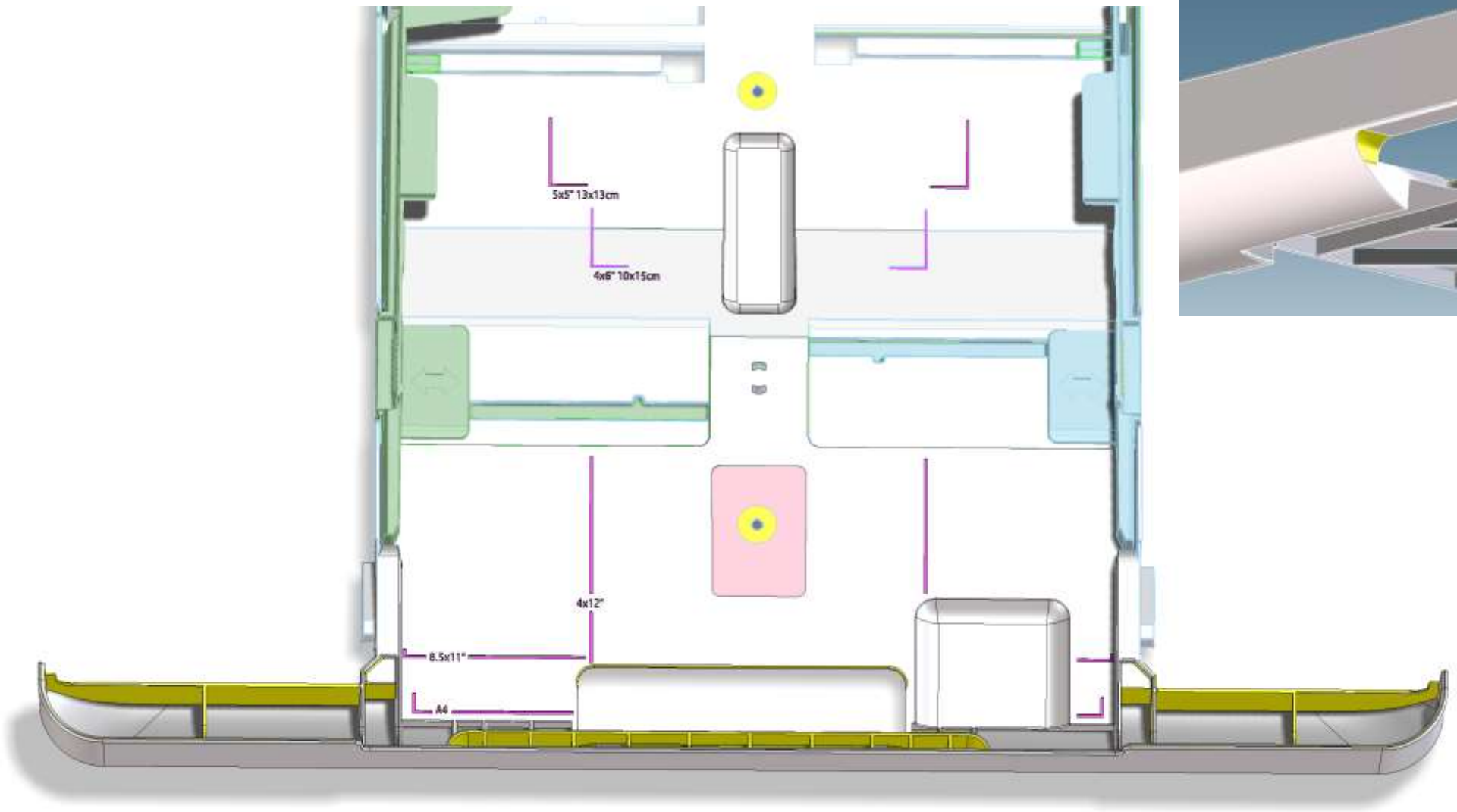
Current part in MM below

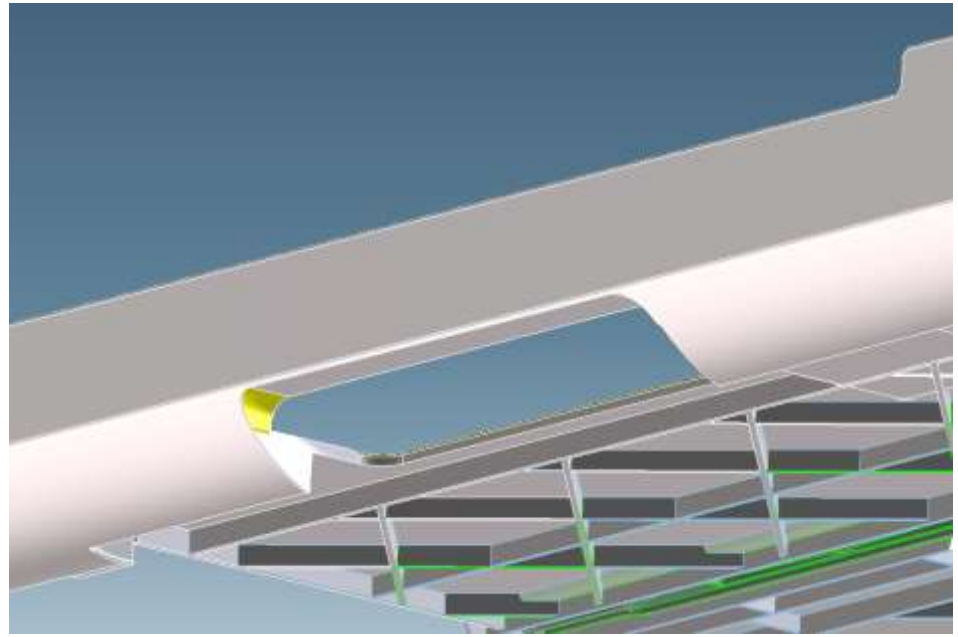


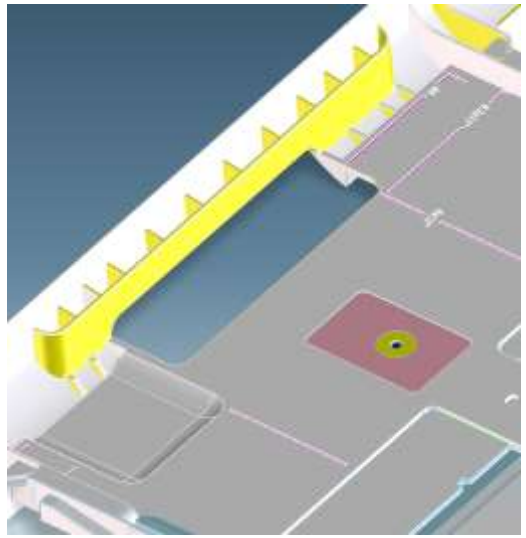
Can we have a handle shape more like this? below
I added 2.25 degrees draft to handle (Z/-Z).
Also note that the scoop has been changed to an opening... Could easily add wall around bottom of opening for structure...
Scoop on right should help for removal of 4x12, A4, and US – and we can test that...



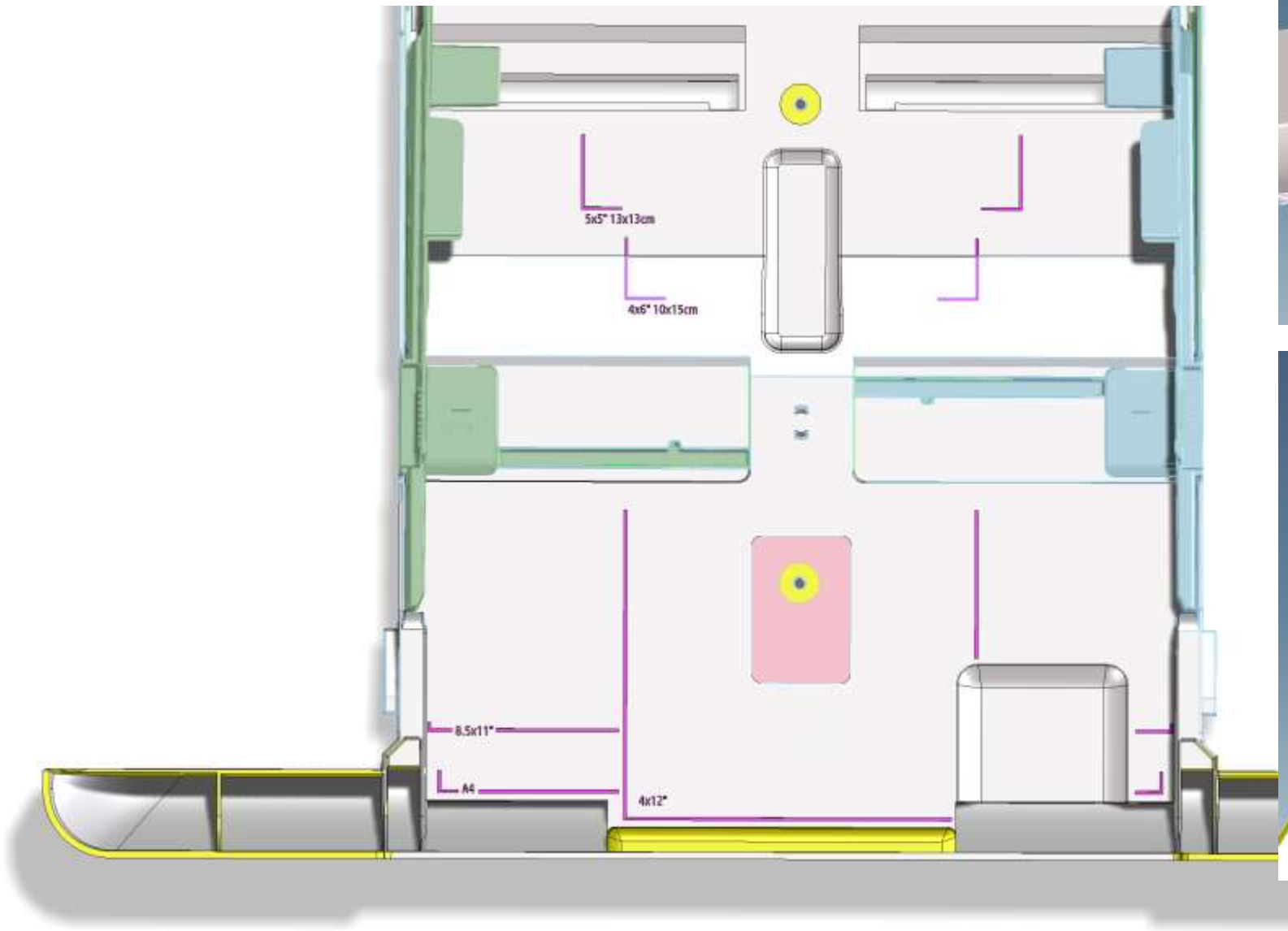
CD2: Open tray affordance design

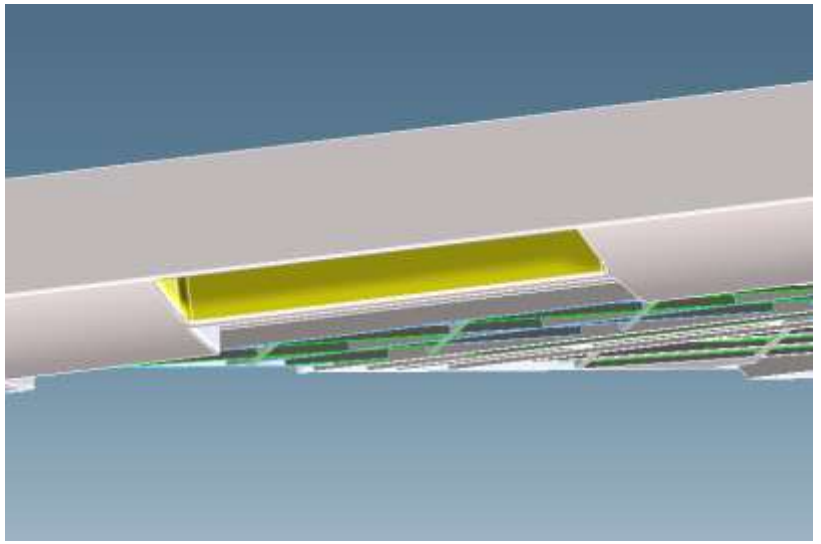


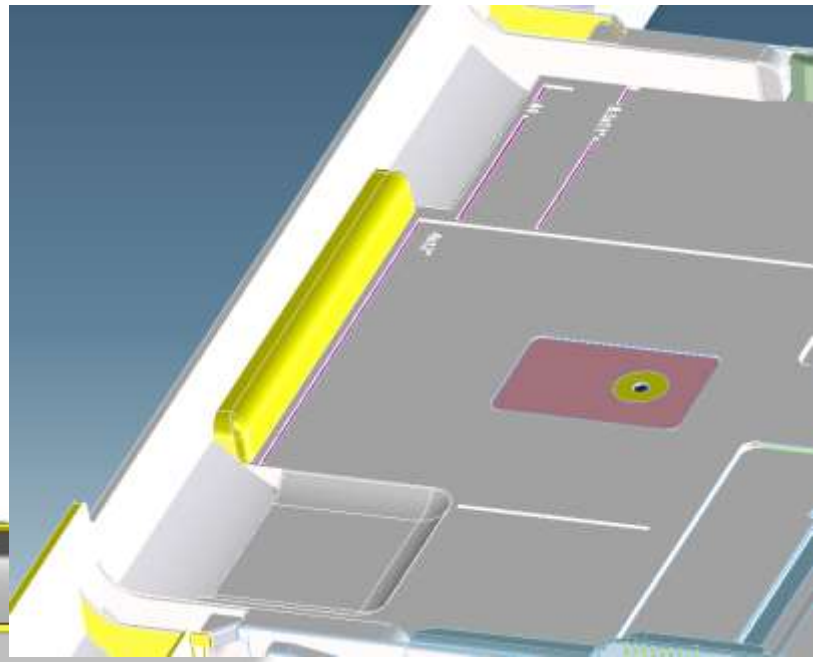




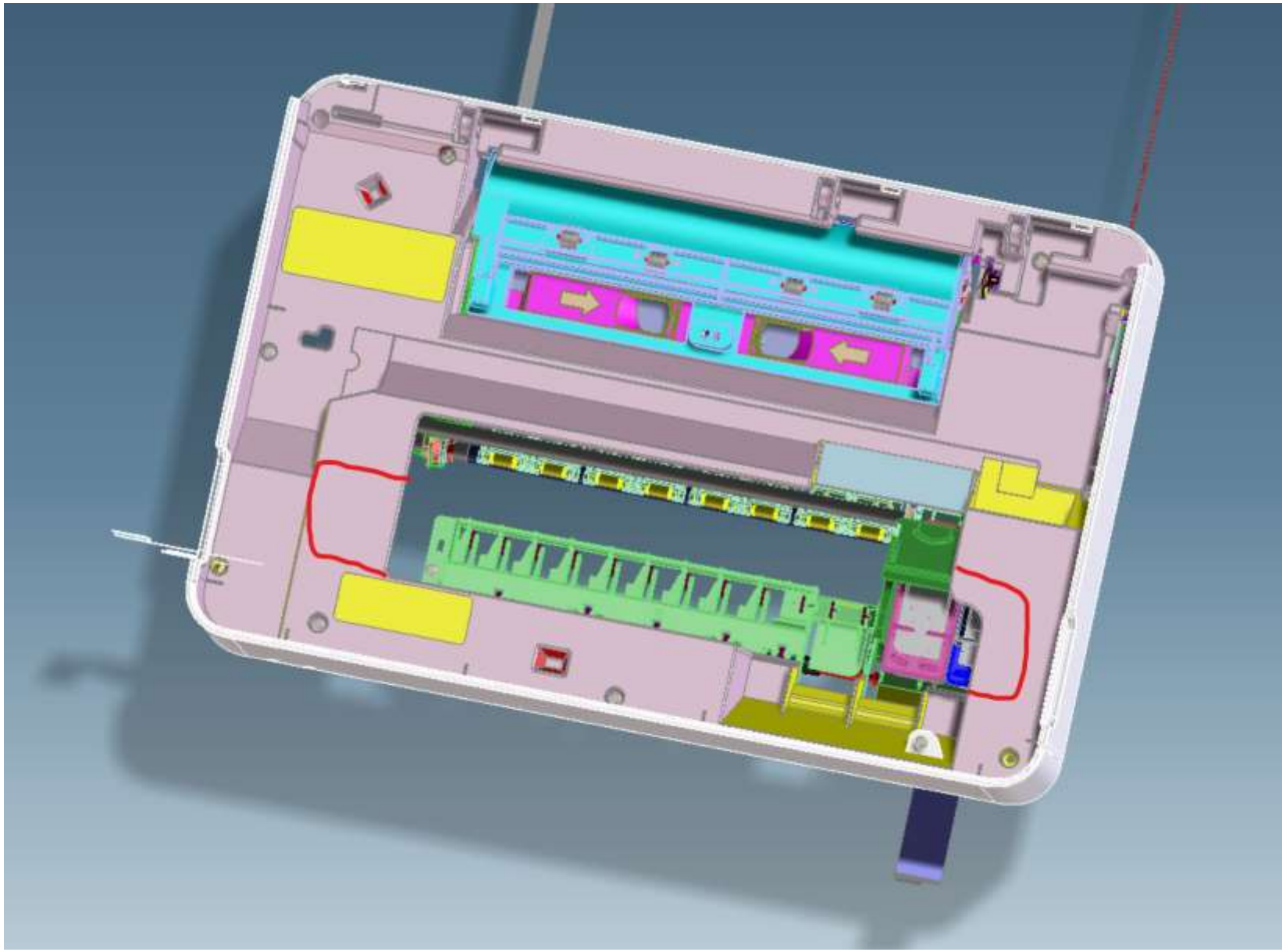
CD2: Closed wall tray affordance design







CD2: Pen loading and height



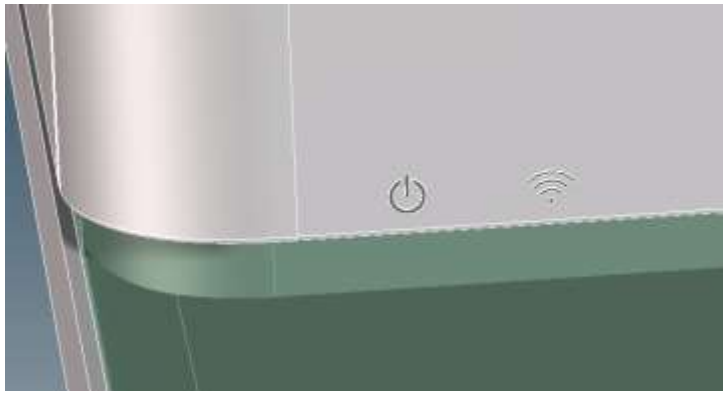
Victoria CD1 CAD Log

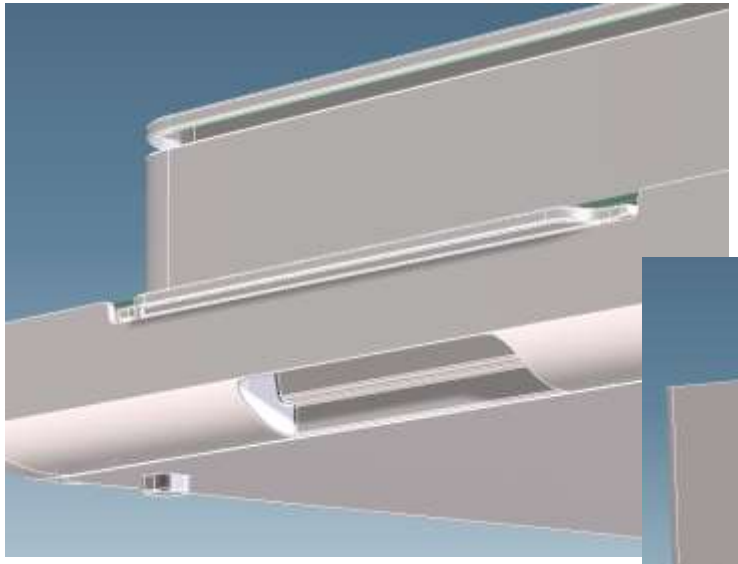
Dan Dwyer, March 9th

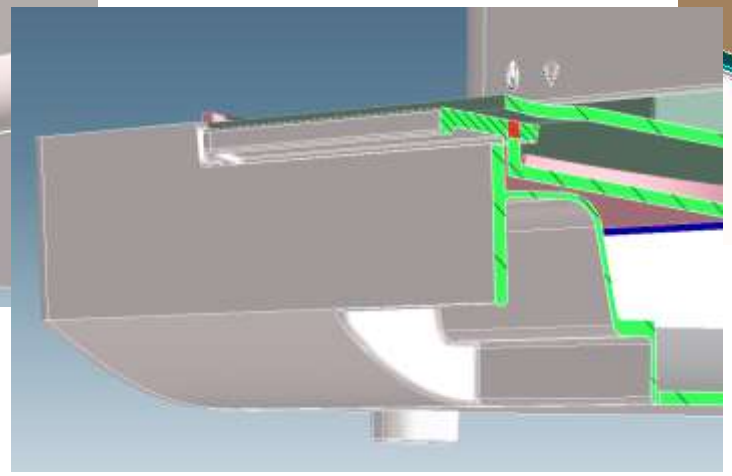
How surfaces and details were created...
All final CAD supplied as CREO Solids pkg, shelled, drafted, correct resolution, not-corrupt.

Victoria CD1 CAD Log

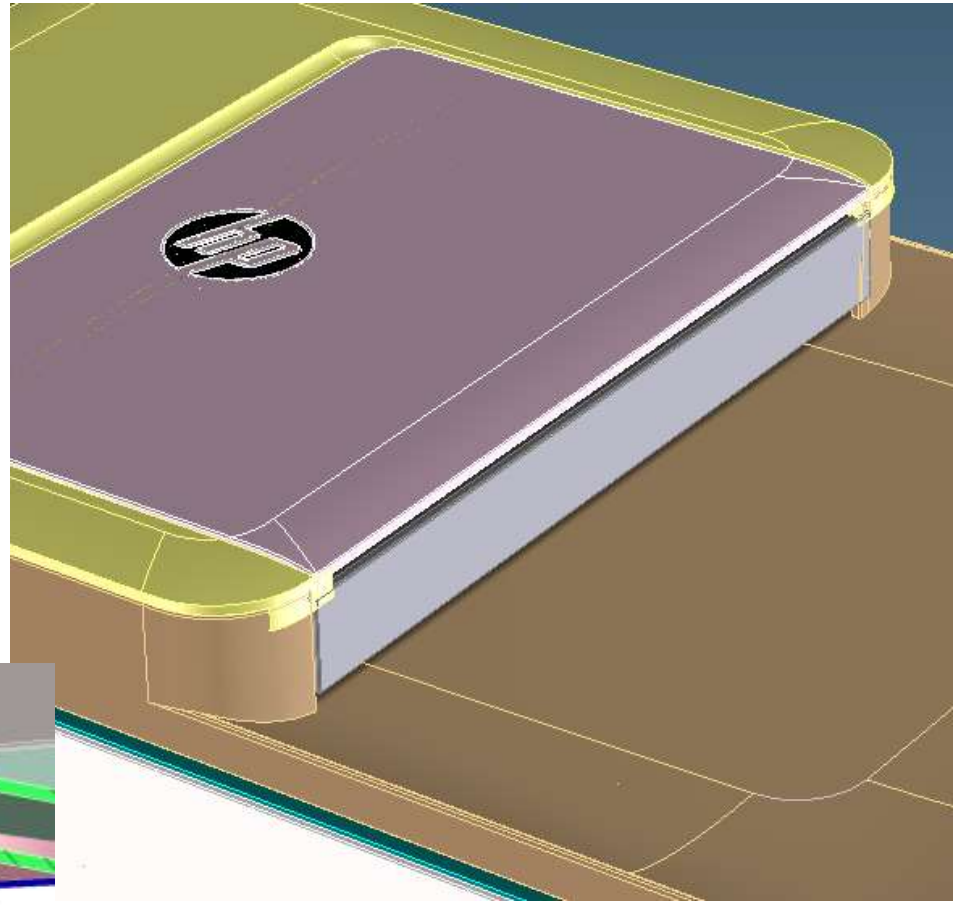
Dan Dwyer, March 9th







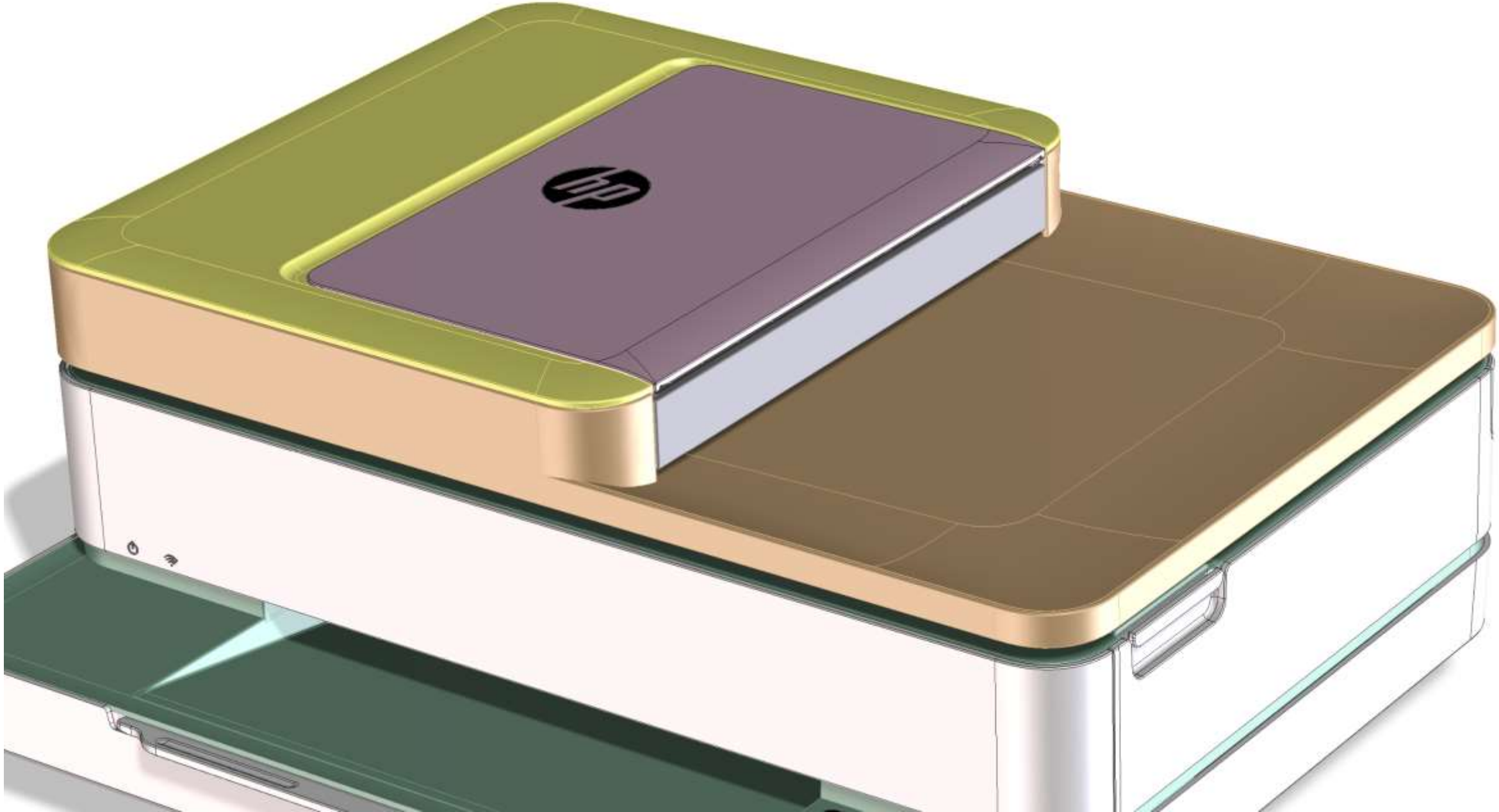
Front pull CAD - WIP



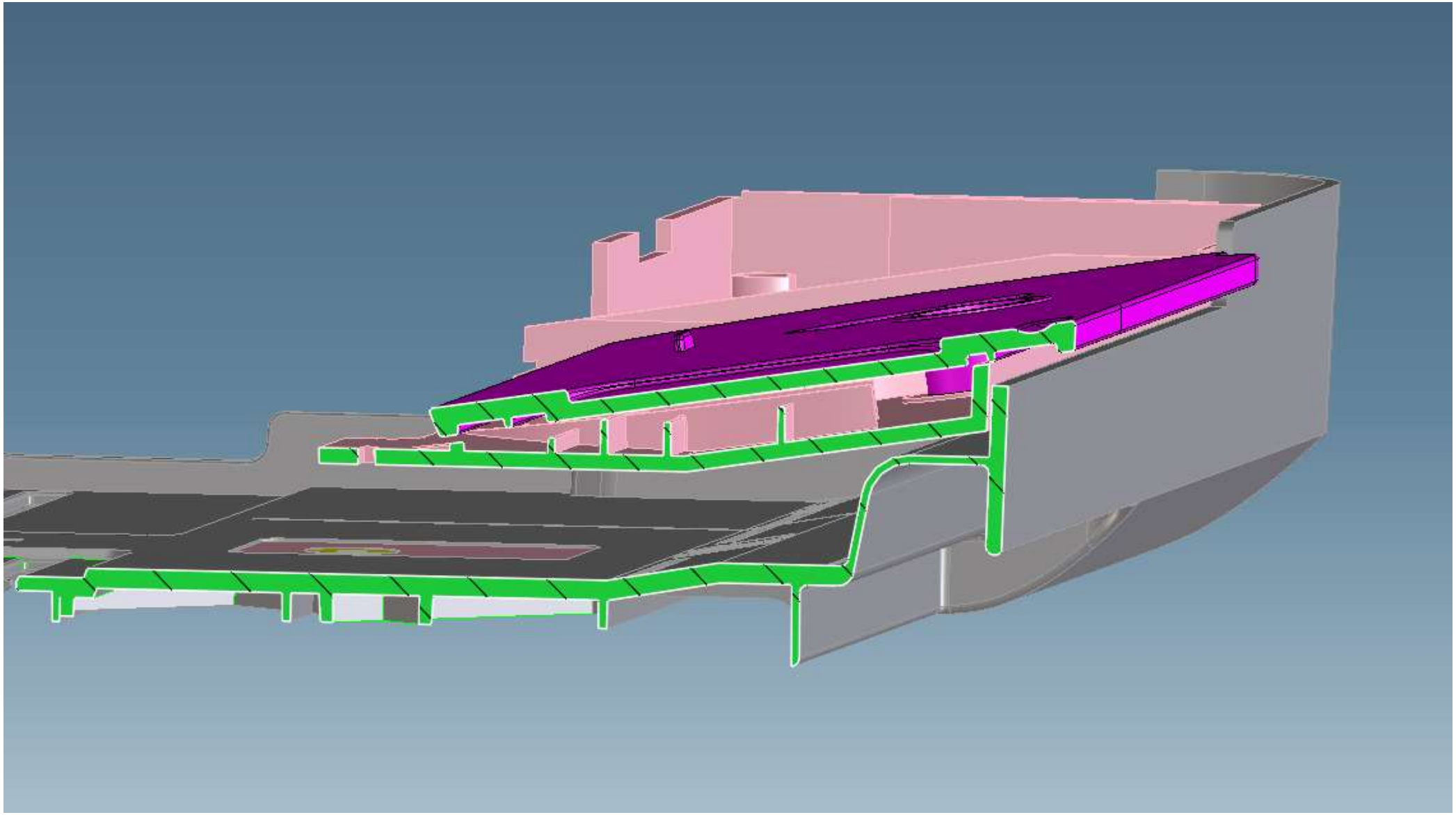
PLUS version 2.4 CAD from Model Mgr today

Feedback from Design Mgmt:
-Keep front pull tray recess below EDGE line
-Want DEBOSSED/recessed icons for Power and WiFi

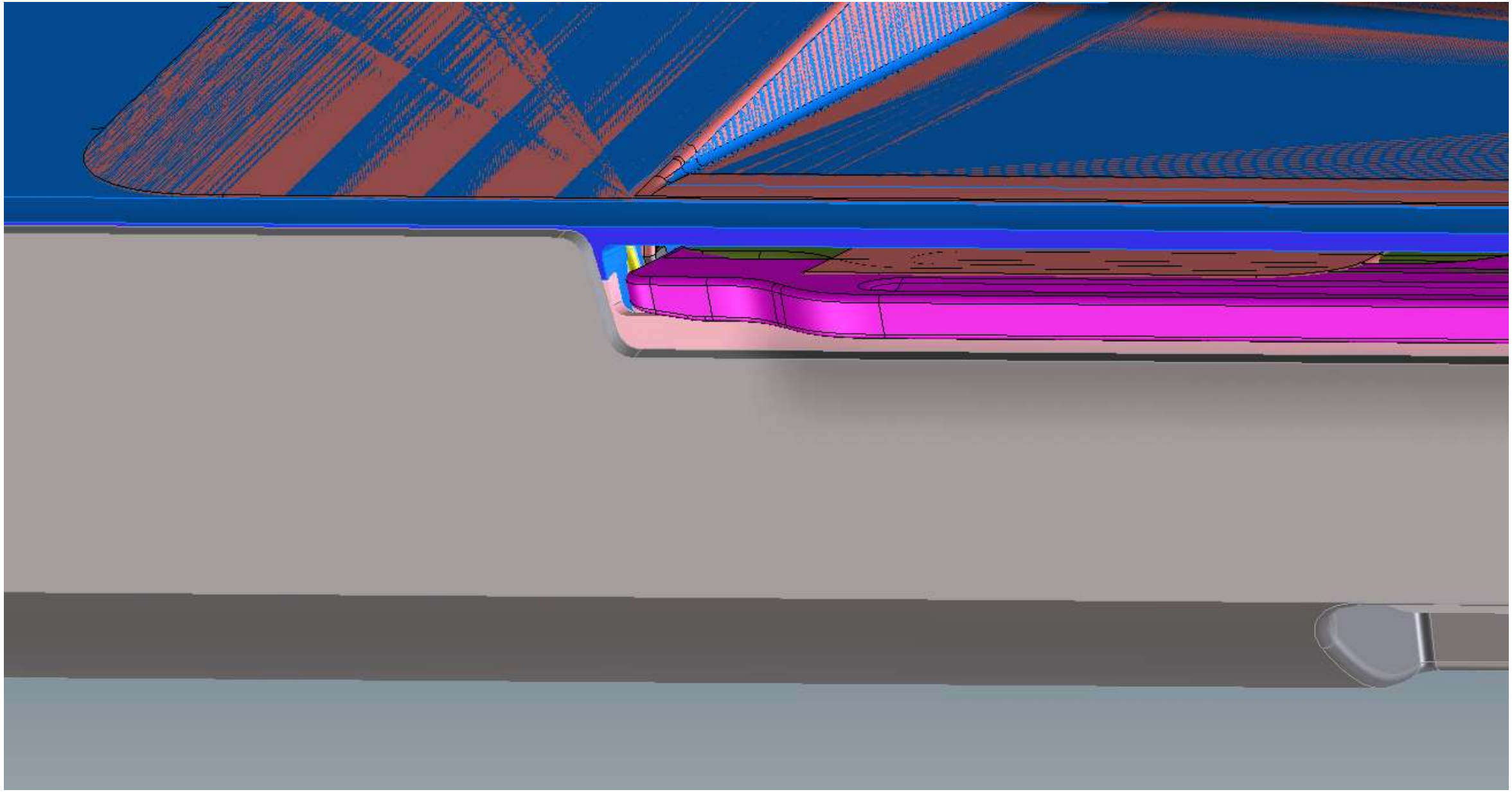
Biyun’s ADF CAD today/March 9th



Biyun's ADF CAD - March 9th

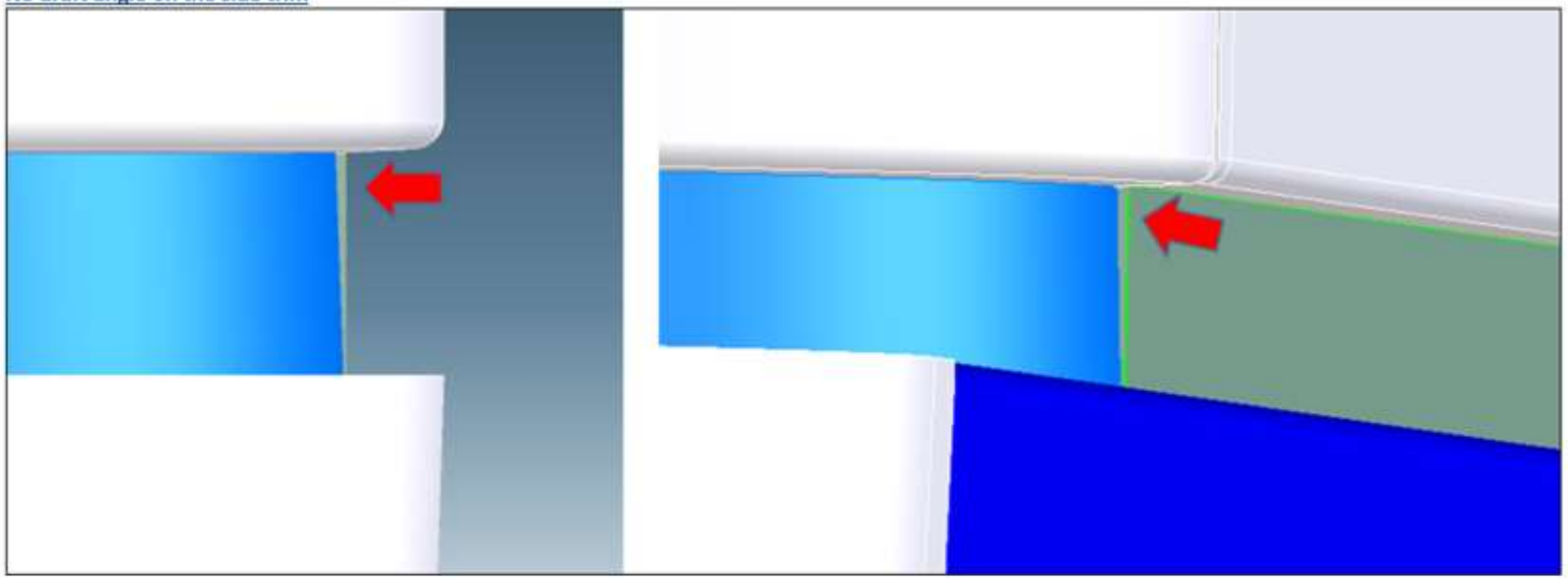


Biyun's ADF CAD - March 9th

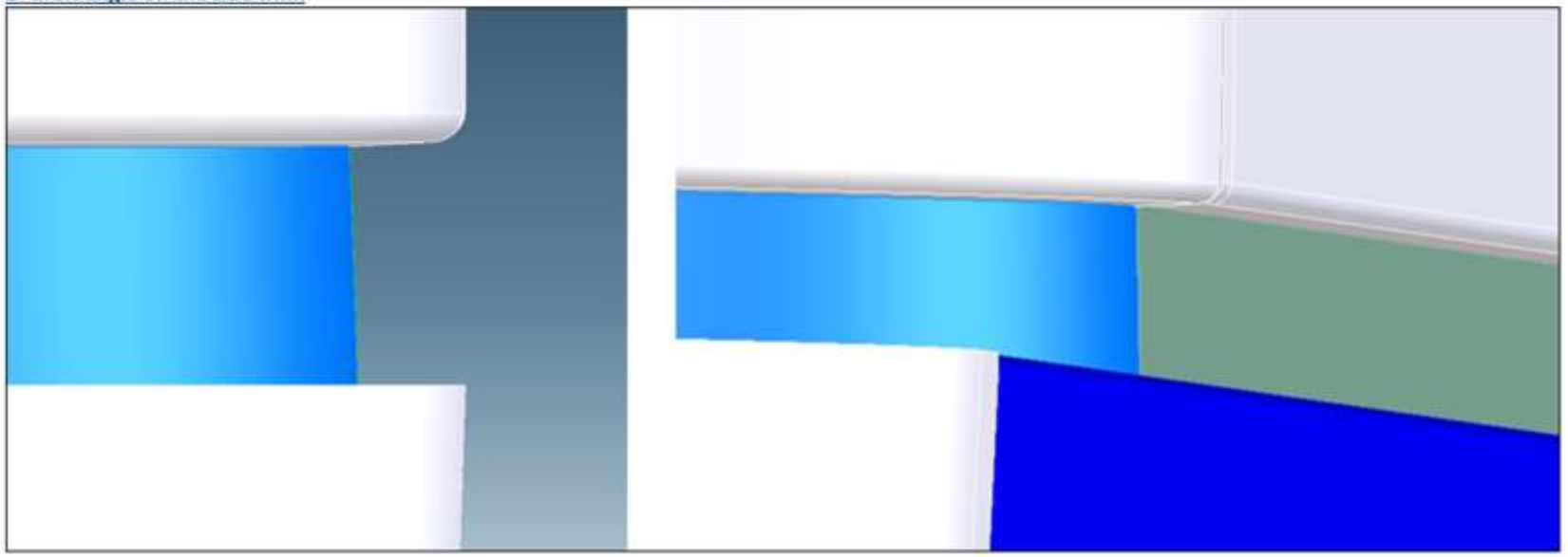


Trim pieces on side…

No draft angle on the side trim



2° draft angle on the side trim.



Hi Dan,

At first glance this looks ok.
The topic of intray side-pulls in other email needs more study. My one early comment on that is “what about the Vasari double-step-in shape? Do we need to keep that?”

Your comment items:

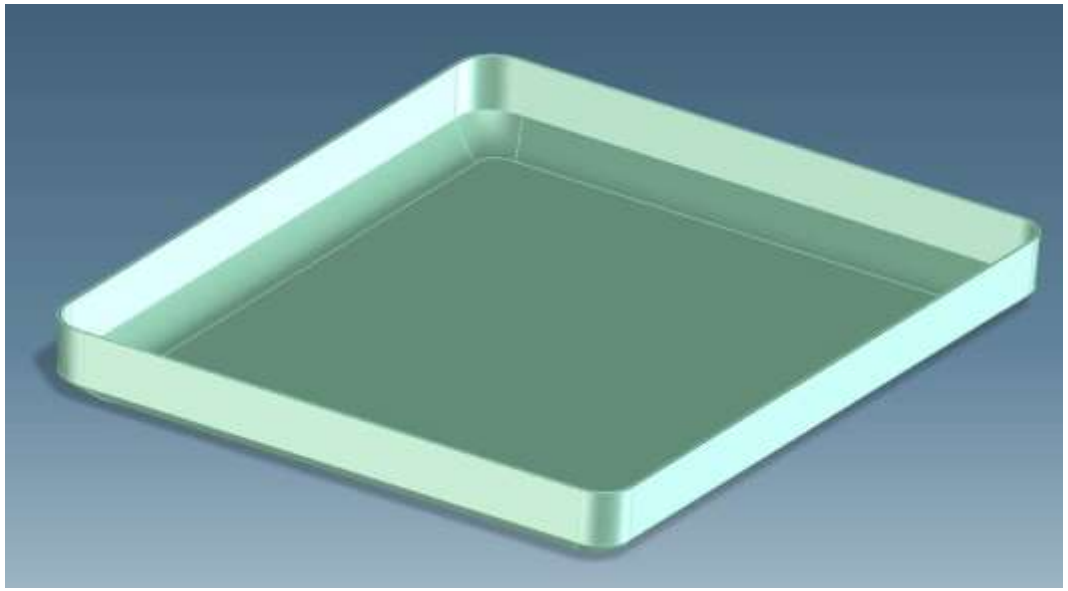
- For this Base, clearances around power supply look same as Vasari, ie 0 clearance. There is slop in the rear of the PS box to accommodate.
- One thing to comment is your ID model has the oval opening for the power plug higher than the power supply hole, so your ID shows the oval all in the vertical face. Reality and Vasari is the oval hole wraps down into the tucked under curved face. I may be able to move PS up to get oval hole 100% onto Vert face but that reduces MPCA real estate to place components…
- Yes we need the separate rear lower curved part that Vasari has. It includes many functional features of paperpath to replicate exactly. I don’t like the thin 1mm zone where the tabs hook under power supply are, but we will keep them unless power supply raising enable full-thickness there. Keeping things closer to Vasari is safer.
- Yes the non-Cocreate custom corner shape in the front is ok to do. Long term we may request the mating custom corner shape for the inside to maintain constant wall thickness for best mold filling, but CD1 doesn’t need that detail.
- Yes we need to use the same bumperfoot- it is used on almost all Consumer products, more than 10M per year, so let’s not change that. The foot position on the power supply side cannot move much with the separate rear-edge part, so I think yes we need to keep it same as Vasari unless you have a major insight.

Yes we should put the evolving solids into the Victoria_PB_ID_SYS in a container. I added you to the HPWG_Victoria workgroup and made a container with Masterdata. You can check out that container and add the solids into the container. Reload that Assy to see the container.

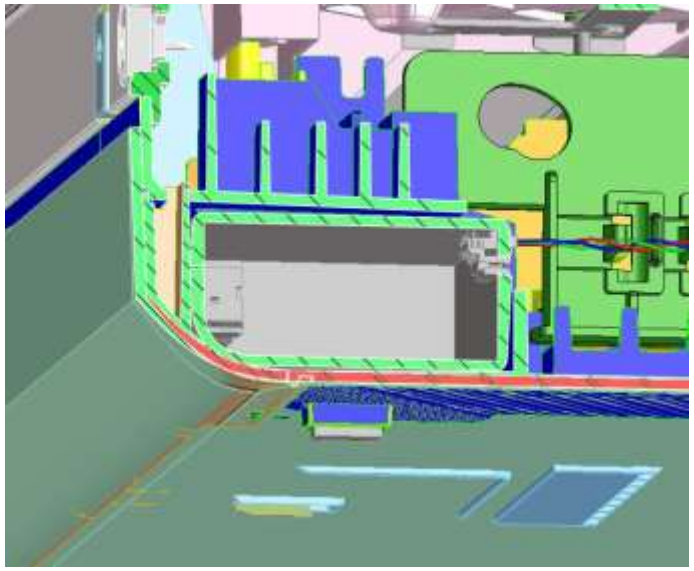
Lots of details to cover. One that comes to mind is the ScanDocLid vertical gap for the full-width shape raised up to Vasari height or whatever to enable to accent color on Scan-Bezel to be viewable. I will bug you about that one for the ScanADF team.

John Sturman.

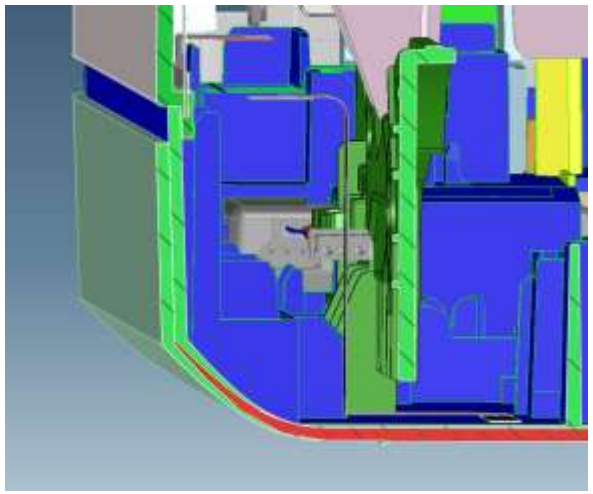
To John Sturman (ME Team Lead),
Time to start collaborating on the Victoria CAD for CD1. I am starting with the base because the top output and deck needs to be custom built to fit inside (dished surface and offset)…
All sides are drafted 2 degrees. Correct GeoRes. Not corrupt…



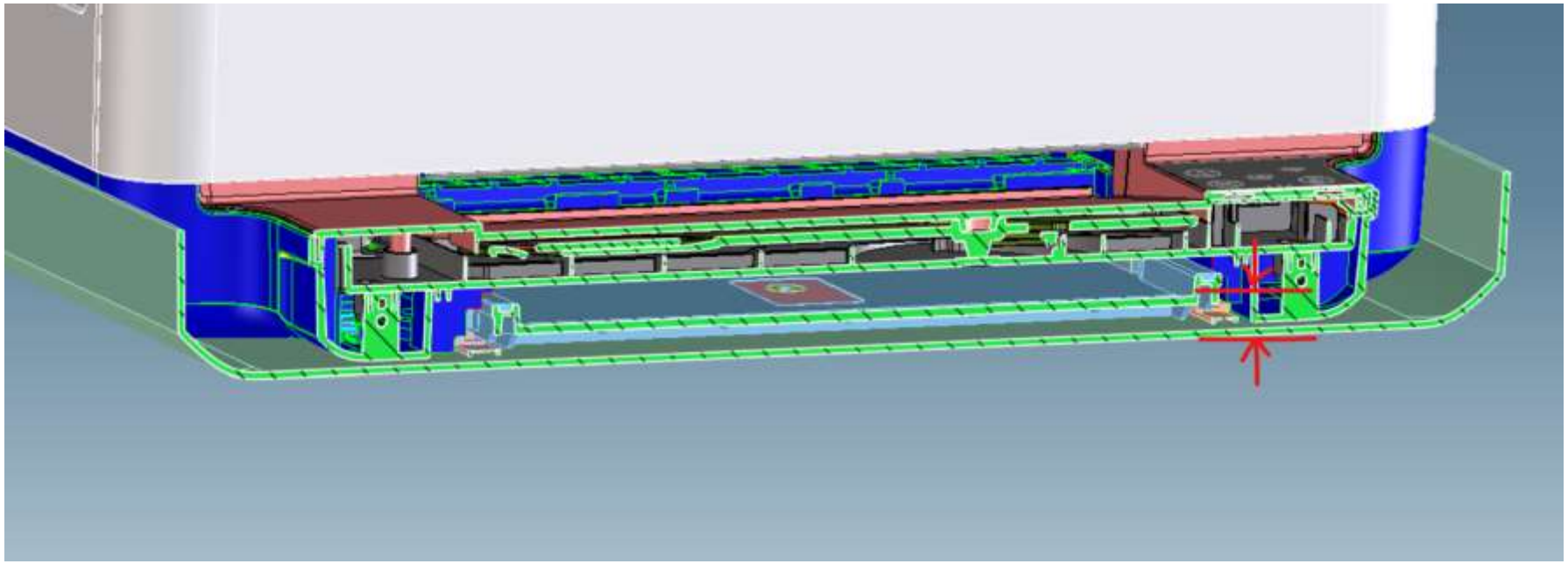
Can you please check the clearances?
Rear radius is slightly steeper to provide clearance around the power supply, but it is close. If you are going to have a sep part like Vasari, we can cheat a little like they do on the separate part…



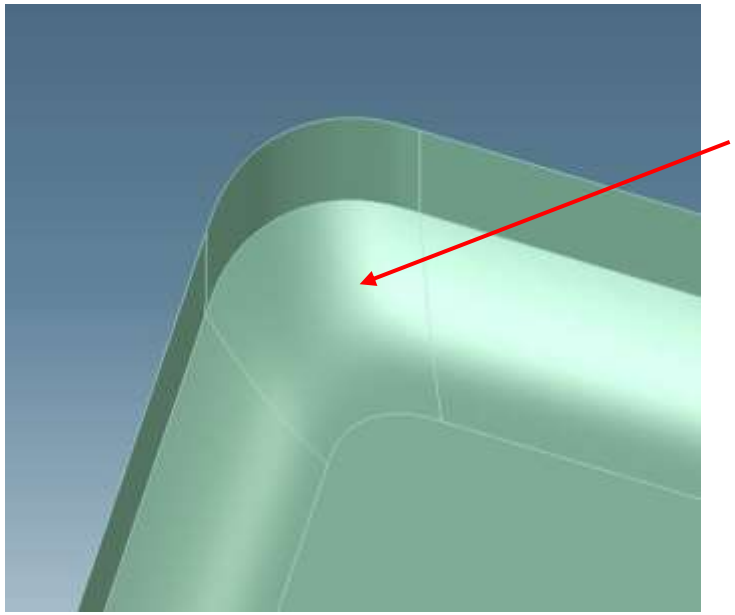
Sides should not be a problem since we are slightly wider than the Vasari base. Clip from front view below.



Remember that the input tray on Vasari is quite a bit higher than the bottom of the product so we will need to work through that and make sure the bottom doesn't have features that poke users hands if they move the product.
Mavis likes the lifted front on Vasari as an option to open the tray, but my medium size fingers can't get under the front… Cecilee and I can look at alternative options in a cosmetic model for CD2 evaluation.

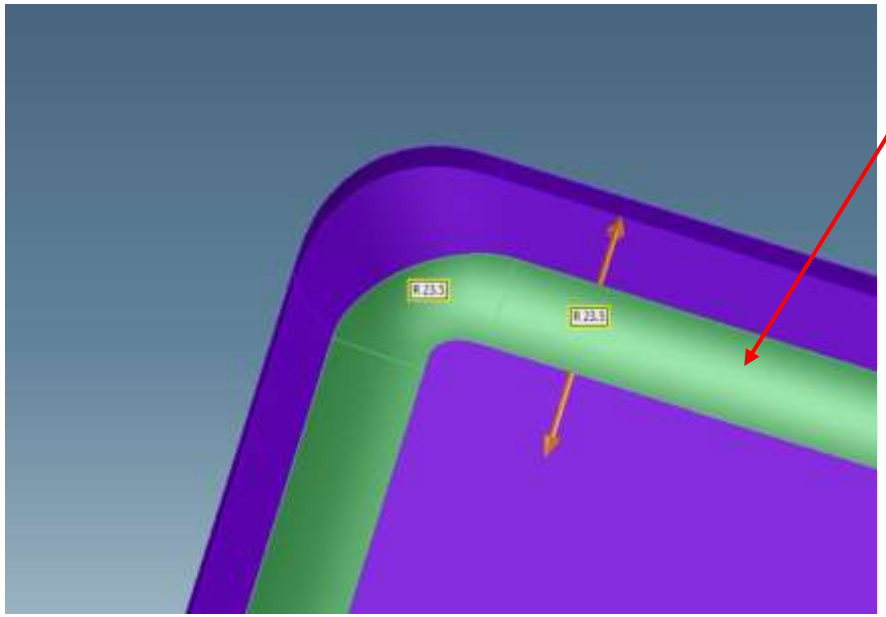


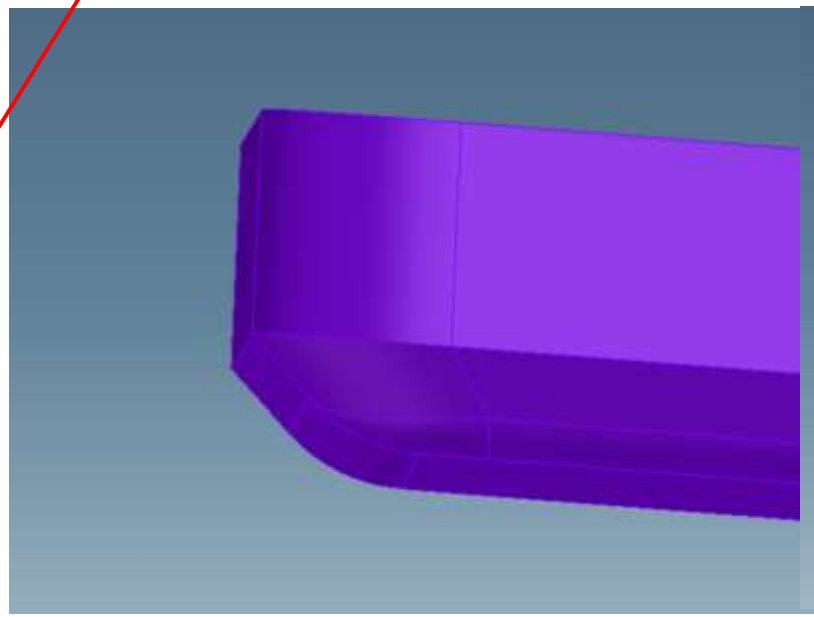
Base-bottom radii: This base version has a custom radius surface around the bottom.
Rear radii is still 28 curvature continuous…

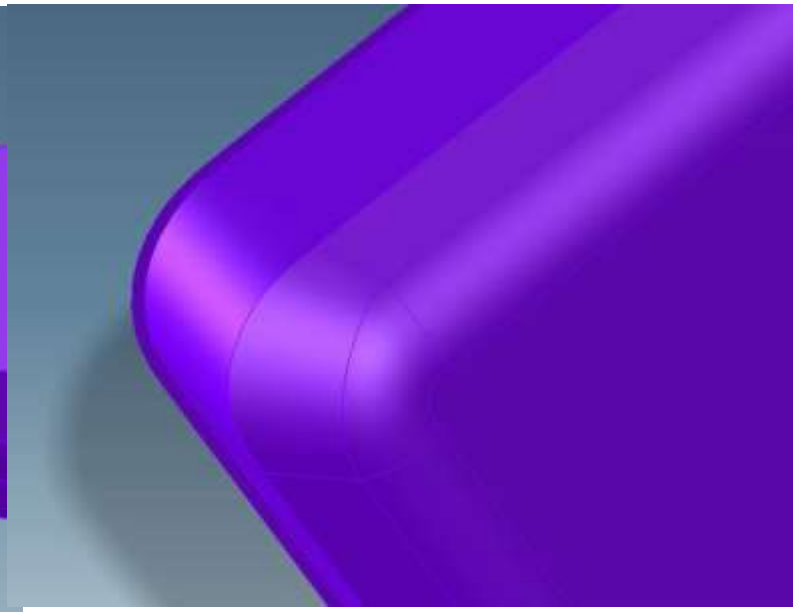


Preferred direction

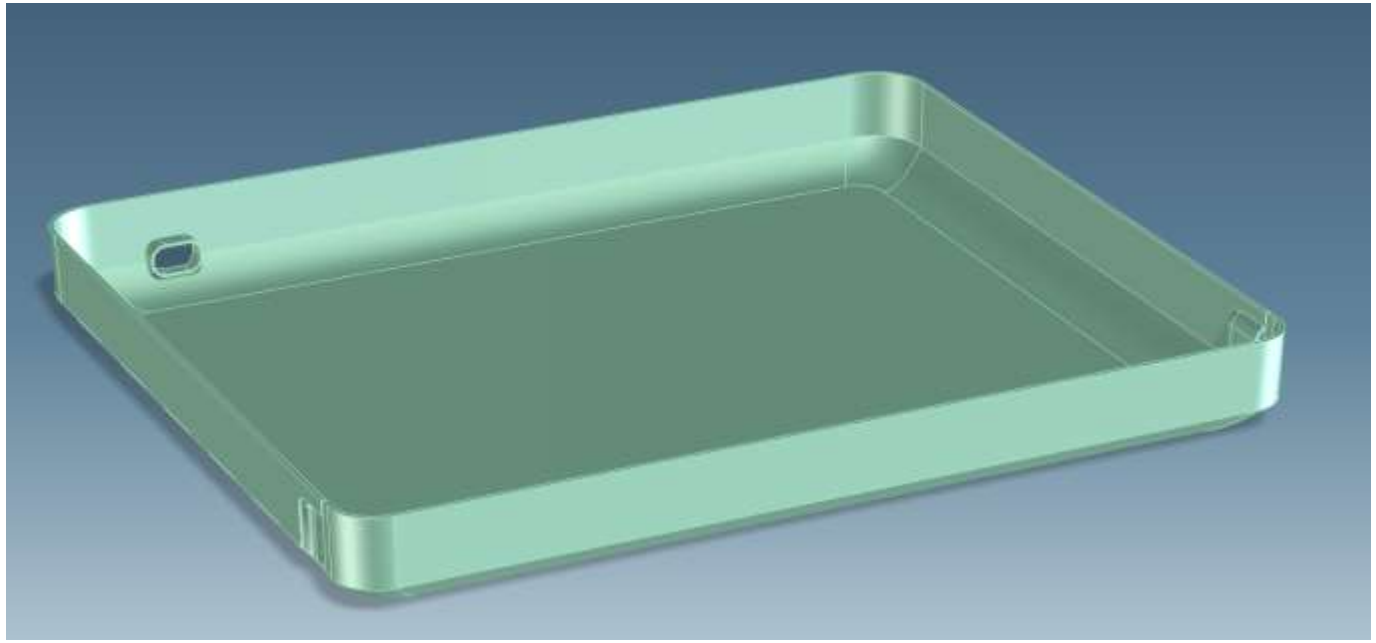
An alternative approach is to chamfer then add a radius to the bottom. But CREO still would not do that (chamfer was too small at bottom to add radius), I had to build the chamfer in a surface modeler program, then add a radius…





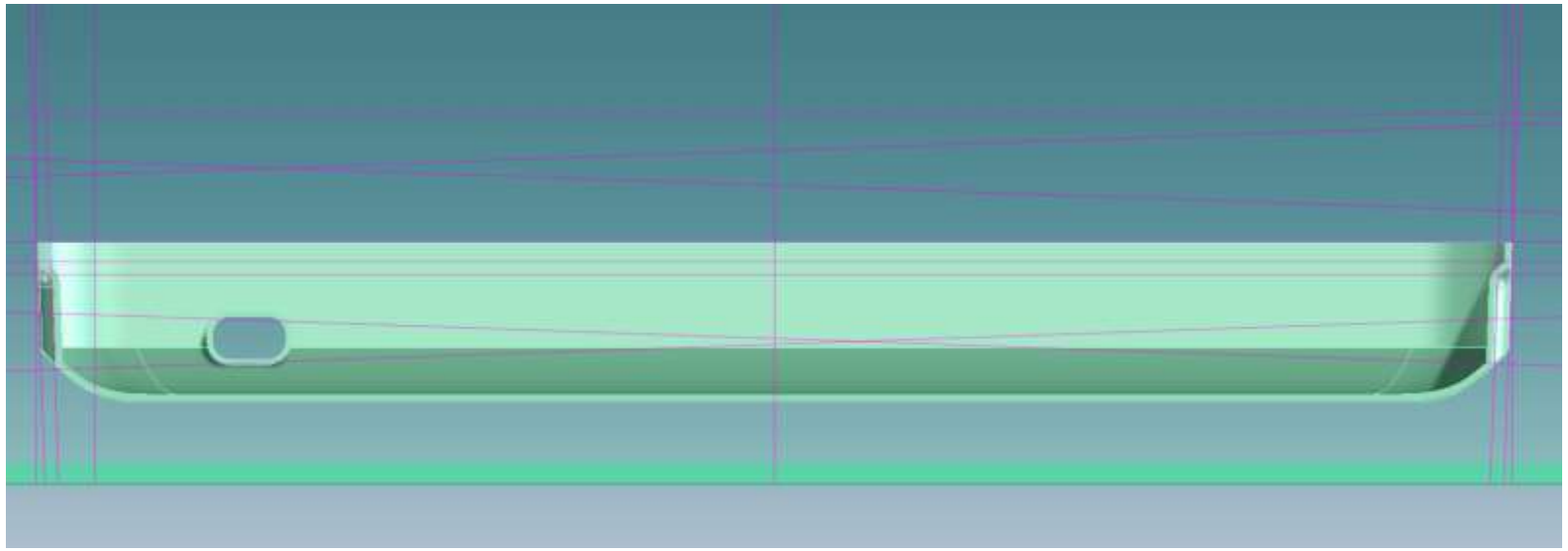


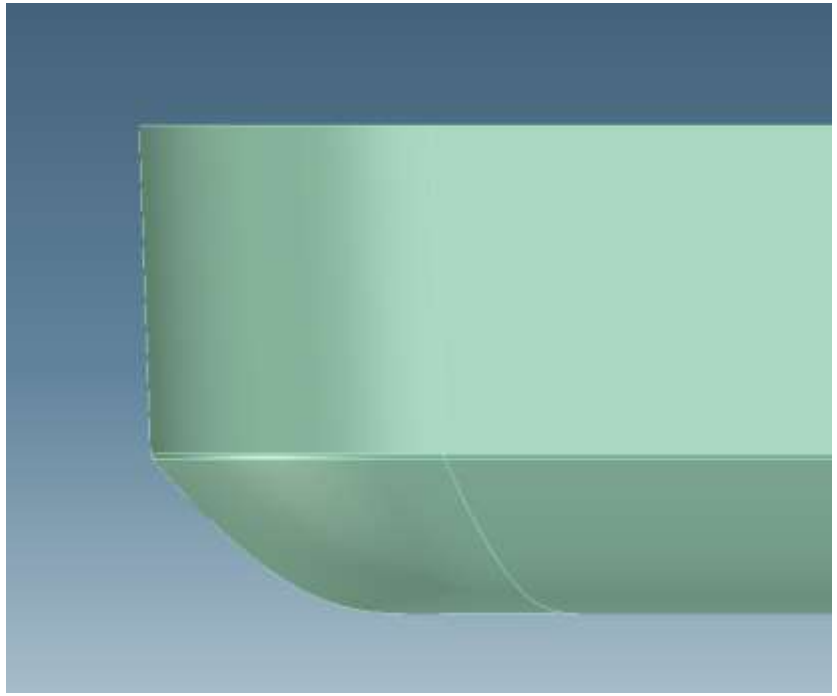
Victoria base part – Drafted 2 degrees – file: ID CAD Rev2c (Feb 22)



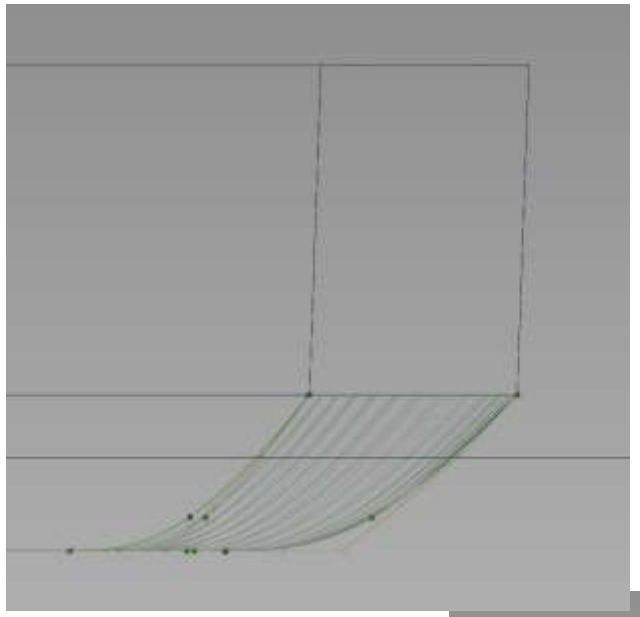
Rev 2c only changes base part. Increased tray affordance depth to 4.3mm and added power plug hole.
Can add power rating nomenclature later…

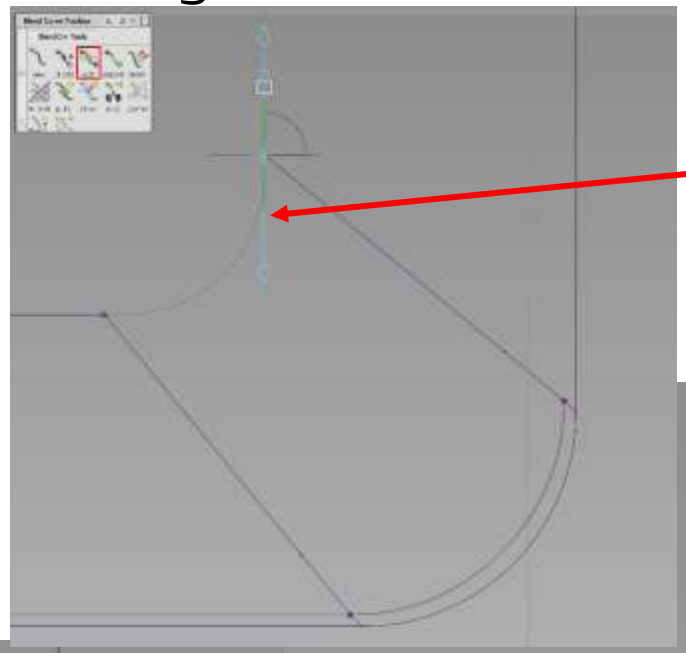
Base part is drafted 2 degrees on all sides…



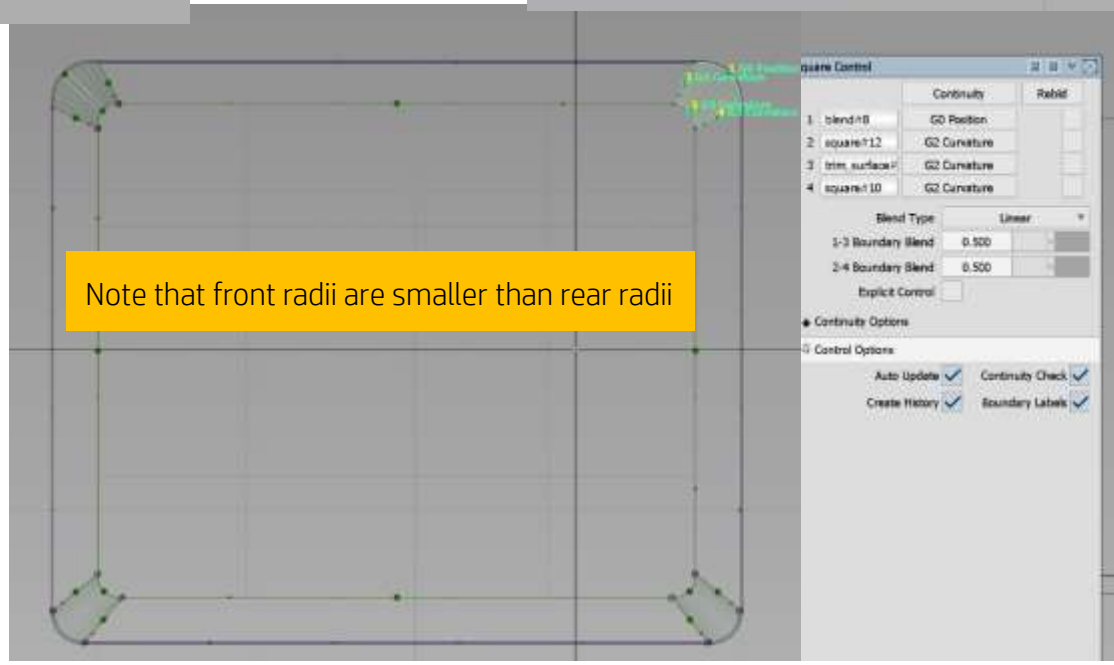


Victoria base part – Drafted 2 degrees – Alias file: Base_Radius3a (2/18)

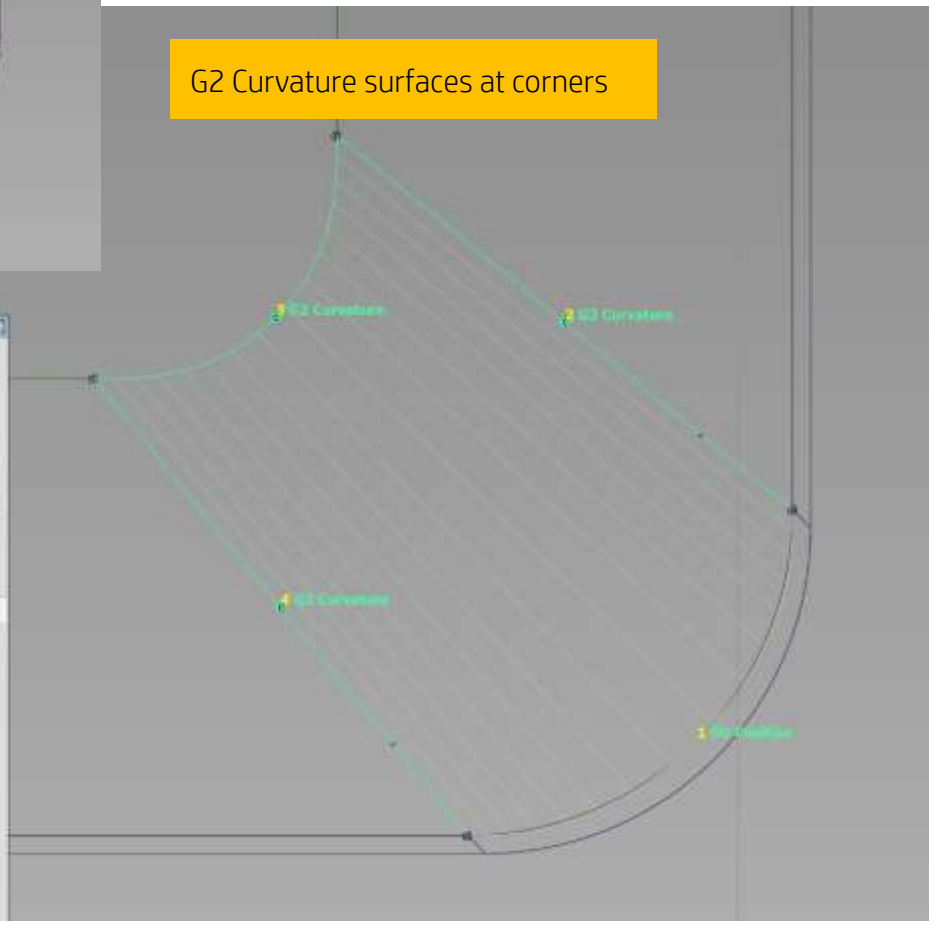


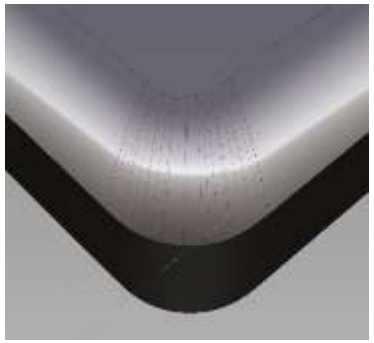


Created larger inside fillet to relax and flow a smooth surface

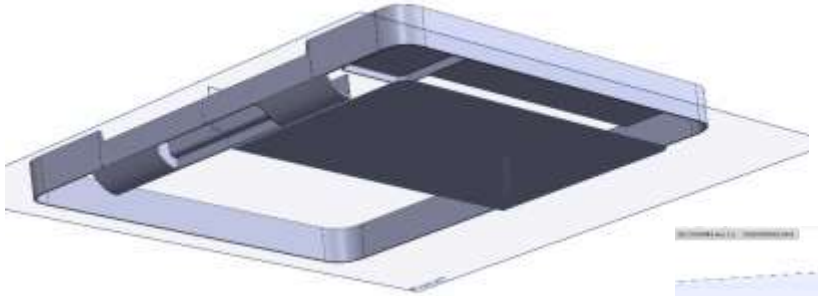


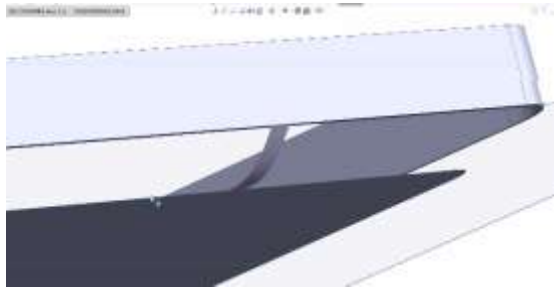
Note that front radii are smaller than rear radii



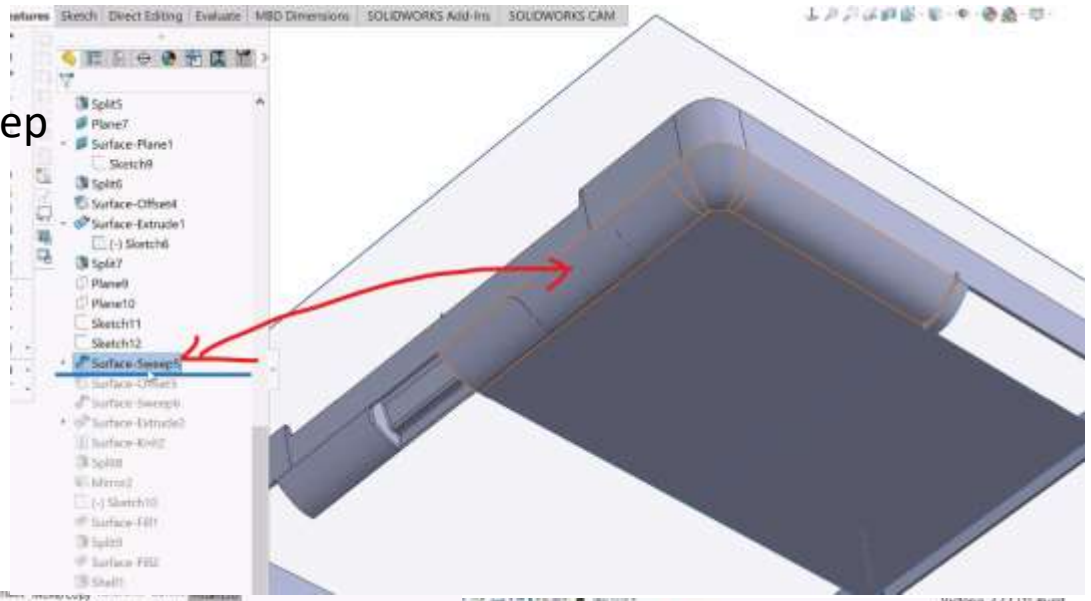


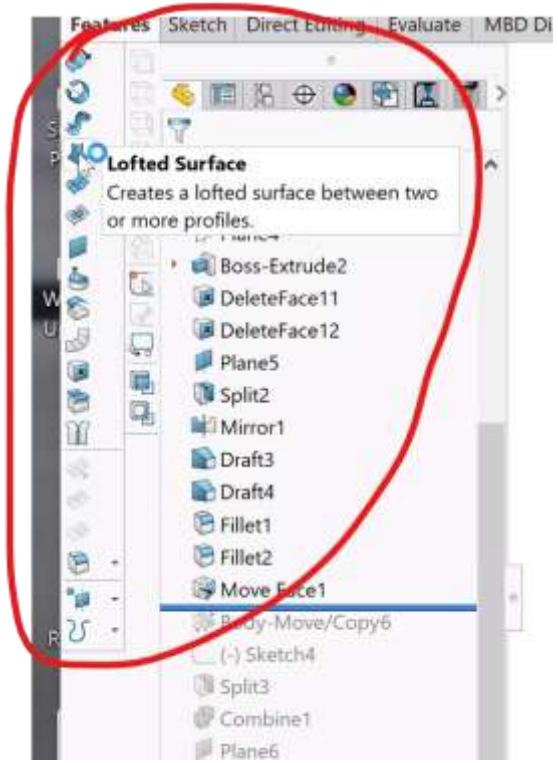
Creating base in SolidWorks (2.7 CGD version, Cecilee)

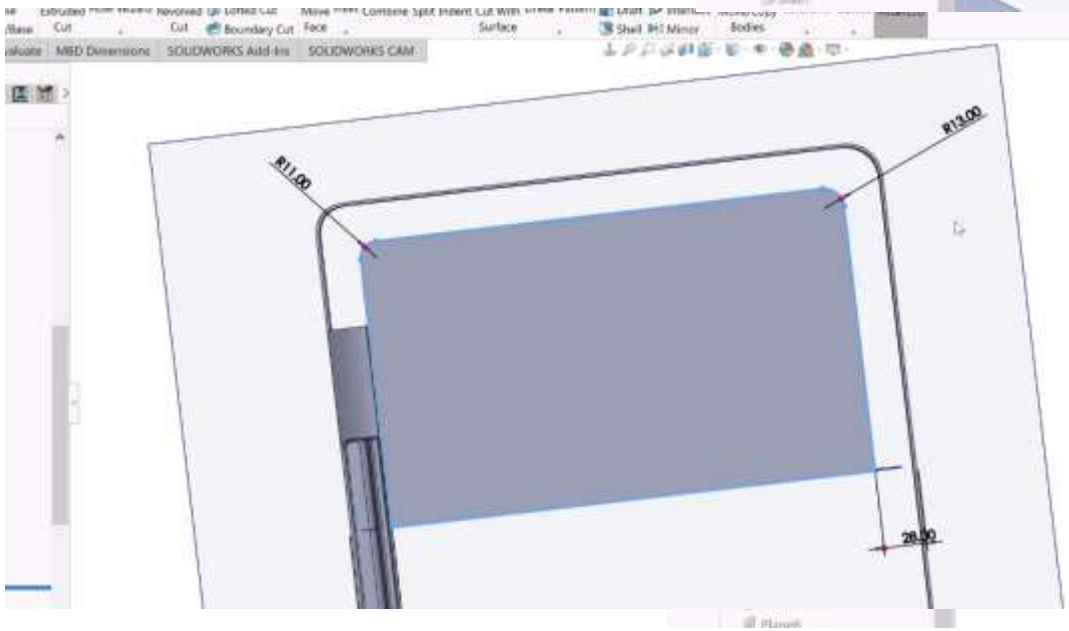




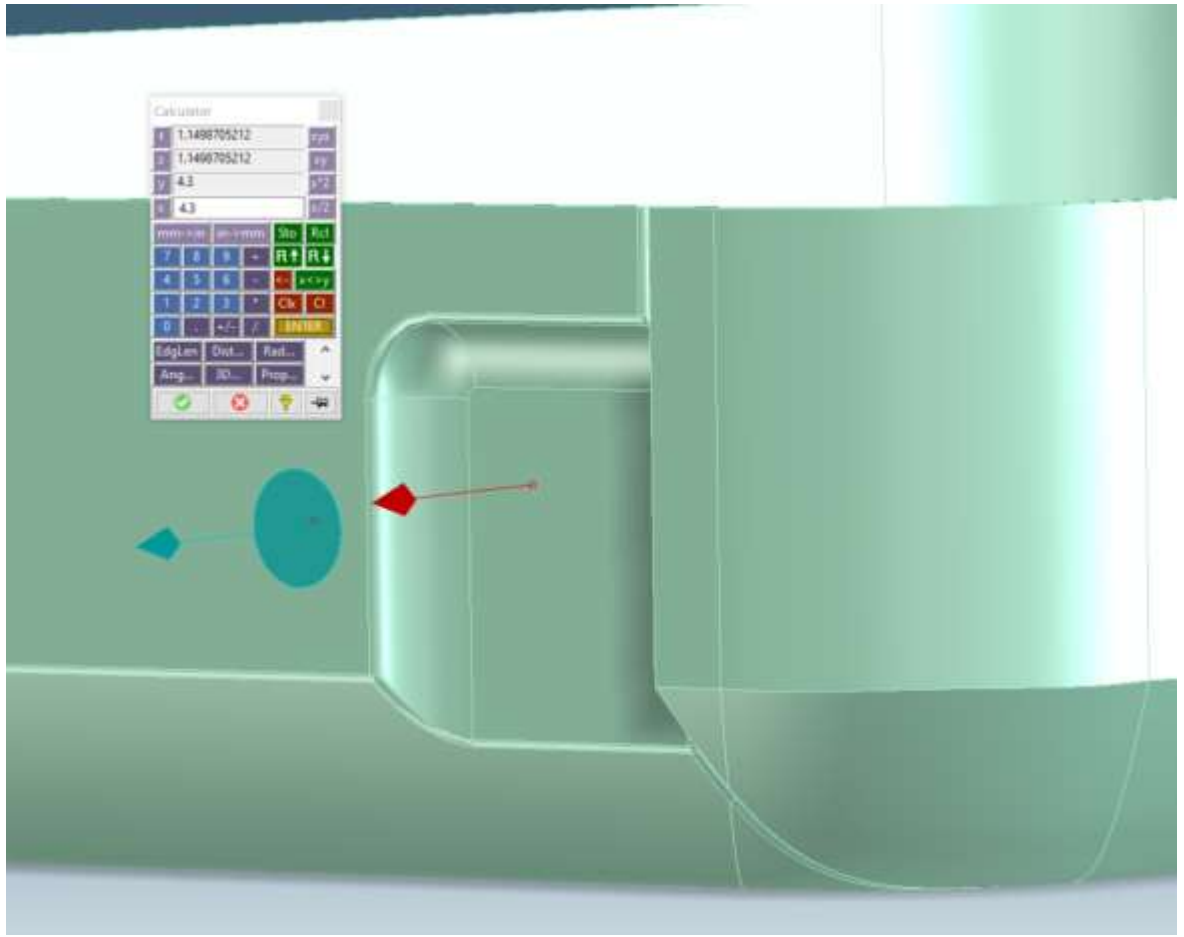
Used Surface Sweep

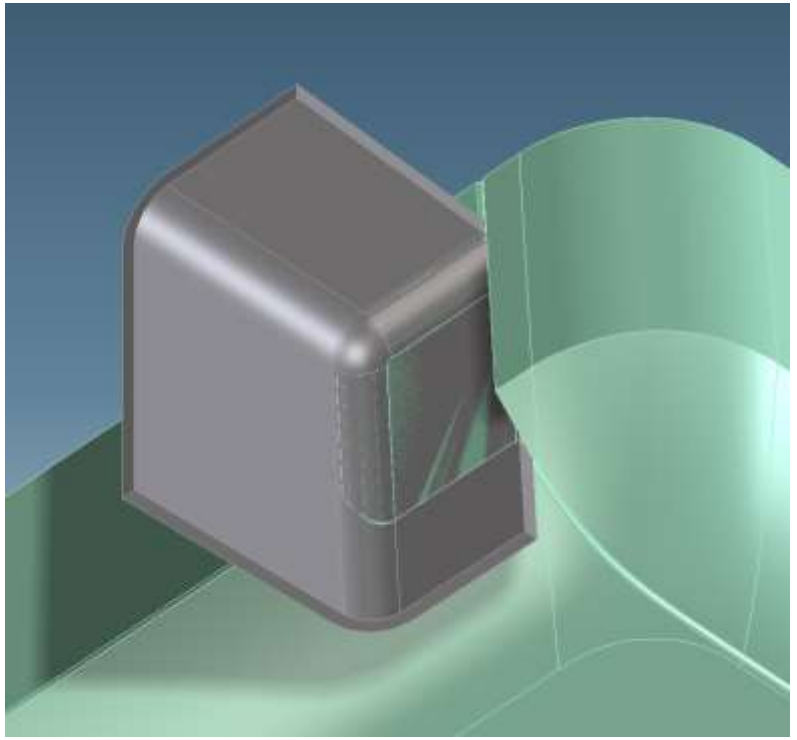






Tray grip details

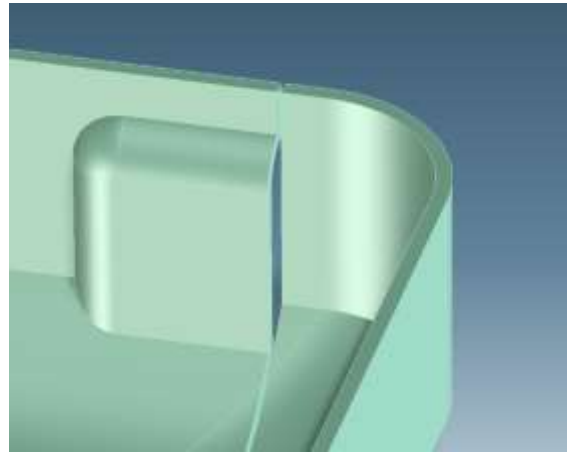




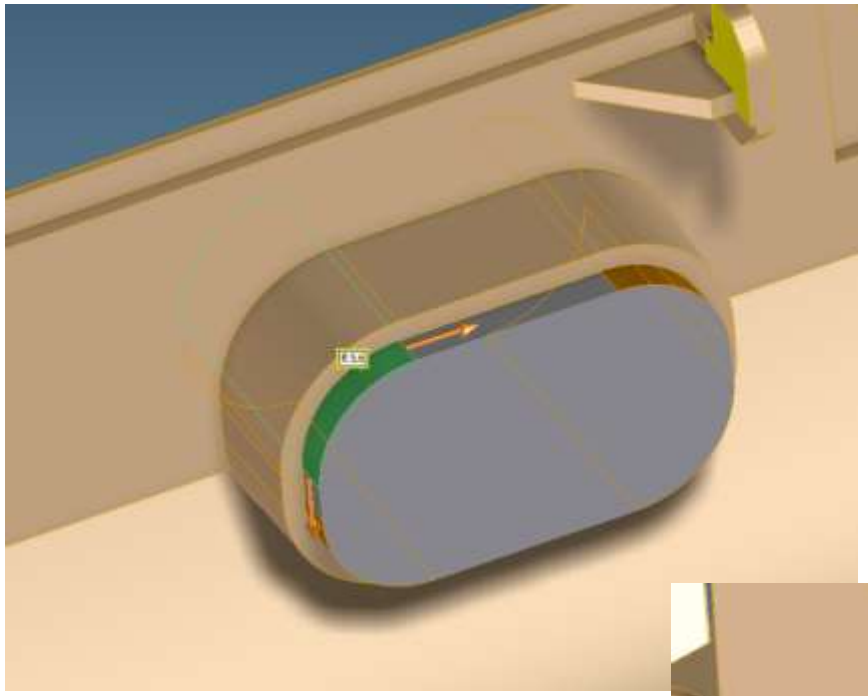
There are sub-tools in a container in CAD

Tray grips are now 4.3 mm deep – Same as mid-chassis pocket depth! No double pocket like Vasari.
2mm wall thickness…
Draft on sides and top.

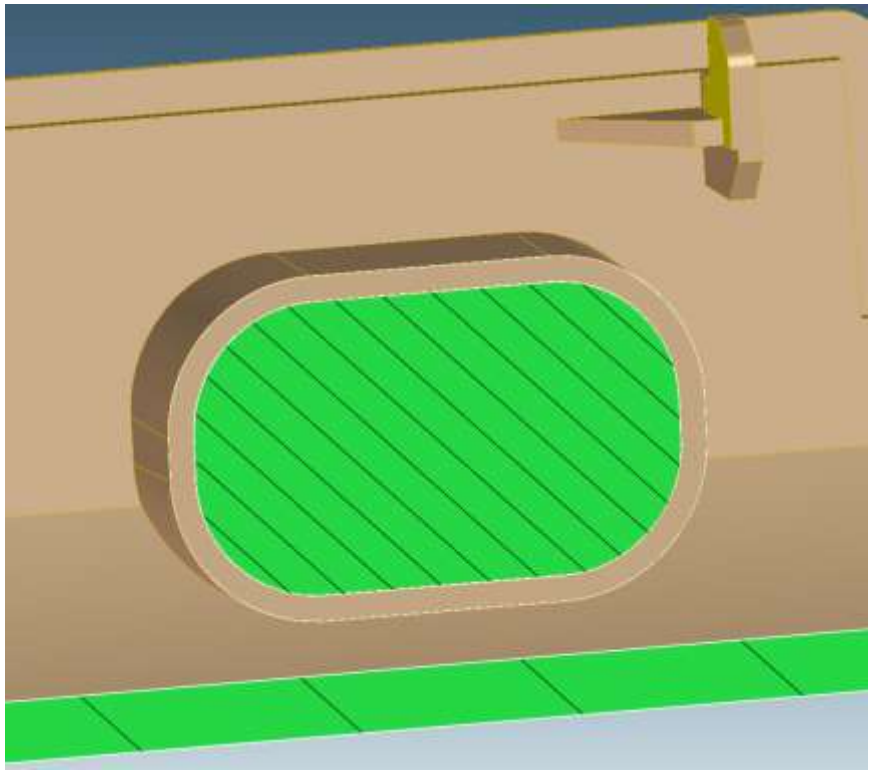
Joel's tray part with added features closes off the hole in the front of the grip – grab area for tray.



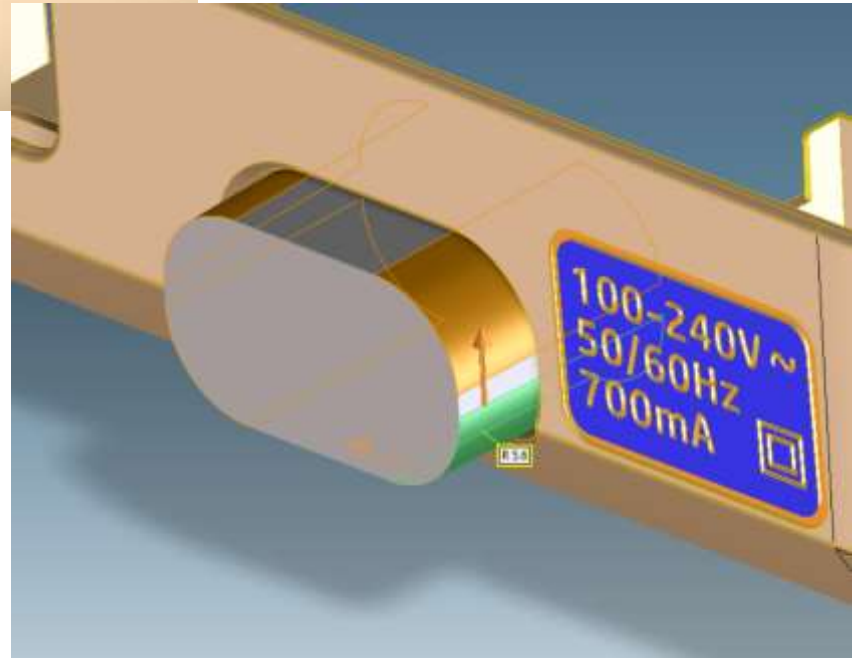
Hole for power plug – should be the same location as Vasari



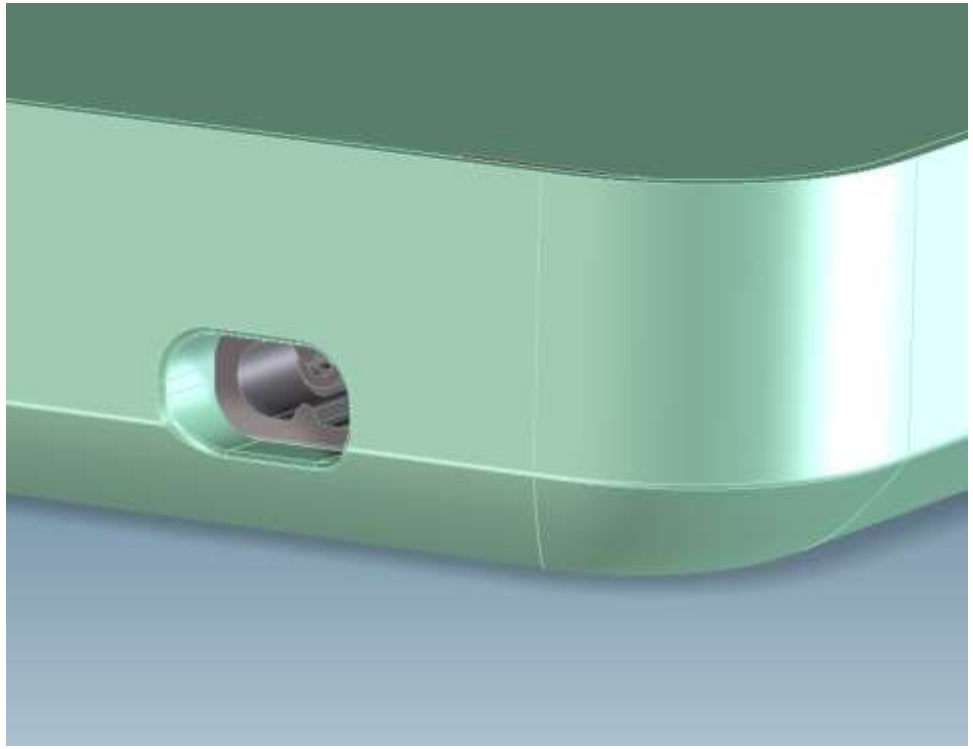
If any of you have production CAD for Vasari – please check location. Make sure I used production CAD, …as long as Power supply is in correct location…



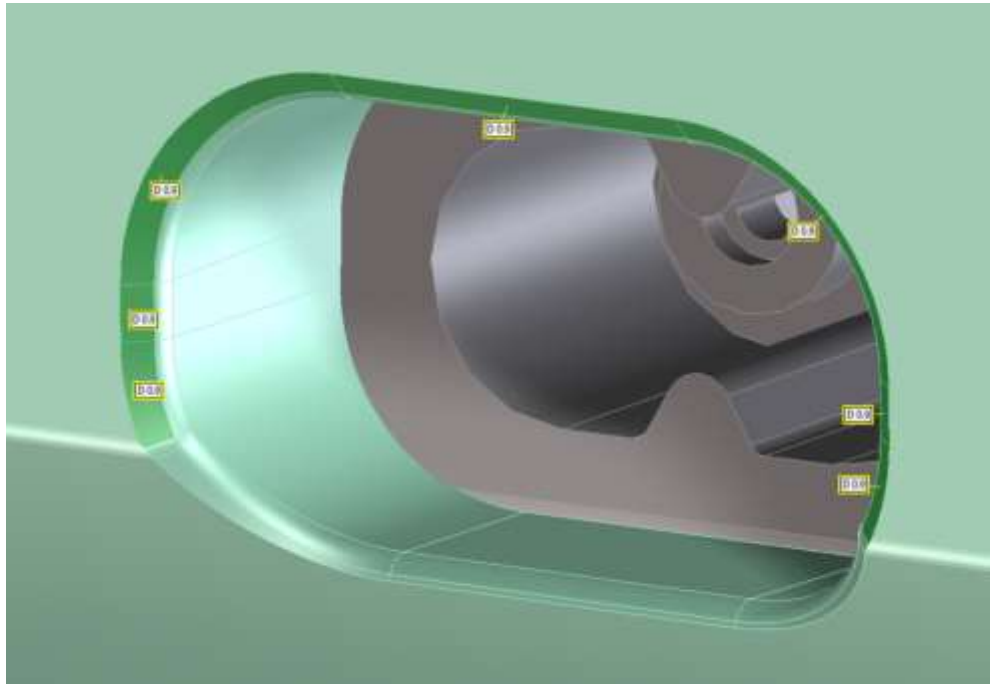
Aligned inside and outside of walls for hole with my Vasari CAD It is drafted on inside – -Y Direction…



Hole for power plug – should be the same location as Vasari



Outside view of base back

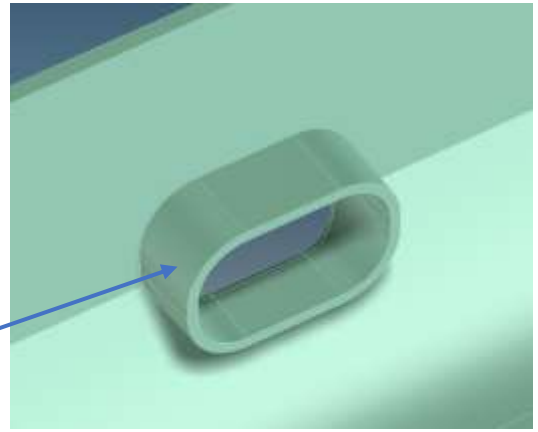


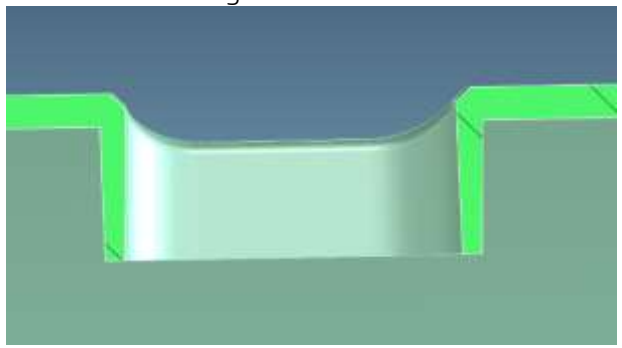
.9mm Constant Chamfer

.8mm radius

There is a version with and without radii if you want to add that in later – might be easier for adding internal features – CREO limitations…

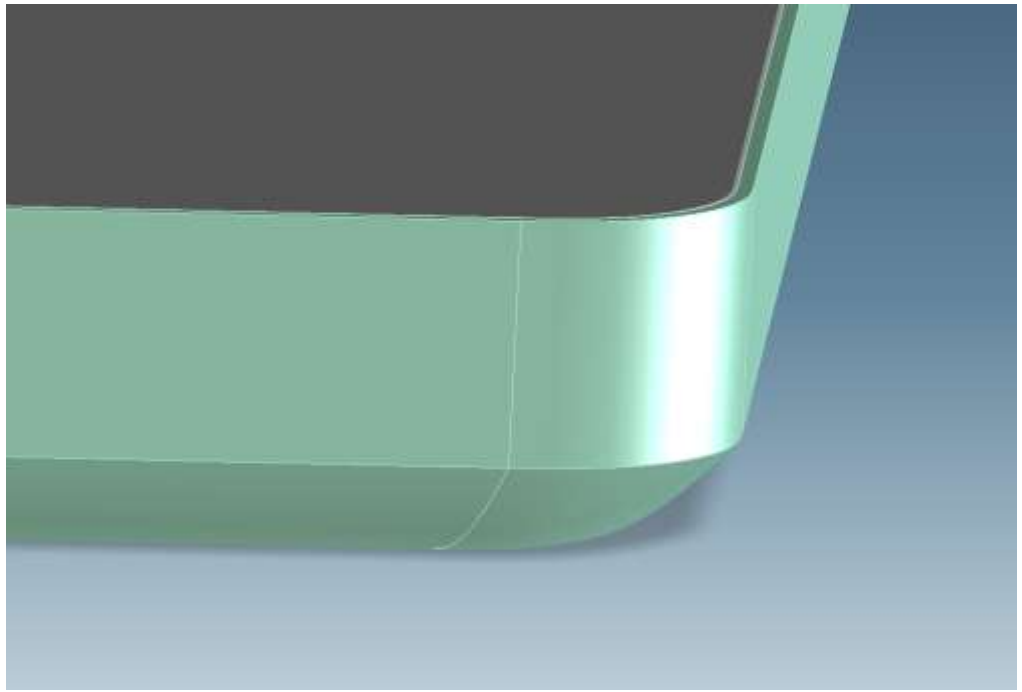
Inside walls should be same as Vasari… Move inside edge if needed for power supply clearance.

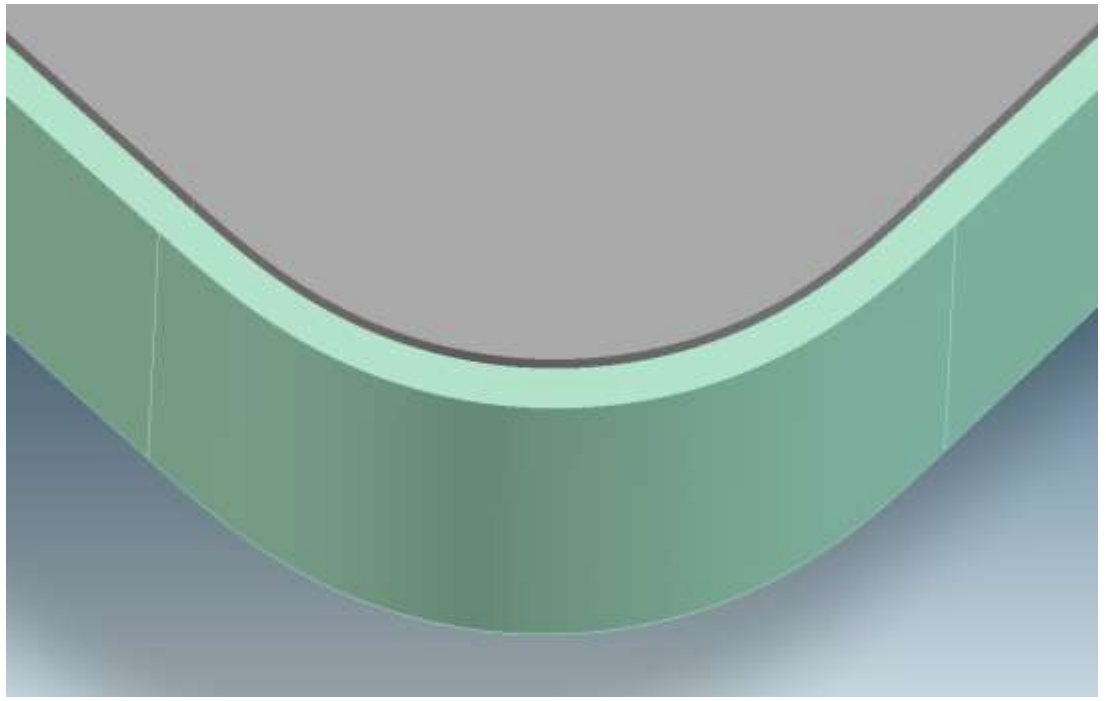




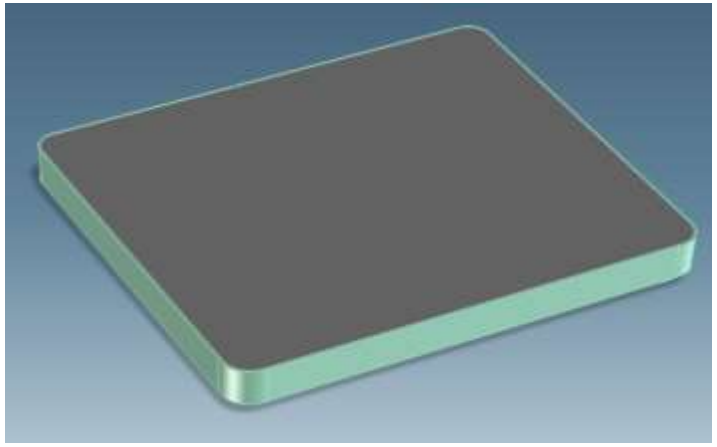
Clip plane from top view looking down in -Z

Creating Output Deck options





Created a part with .5mm offset to base and aligned at top surface…

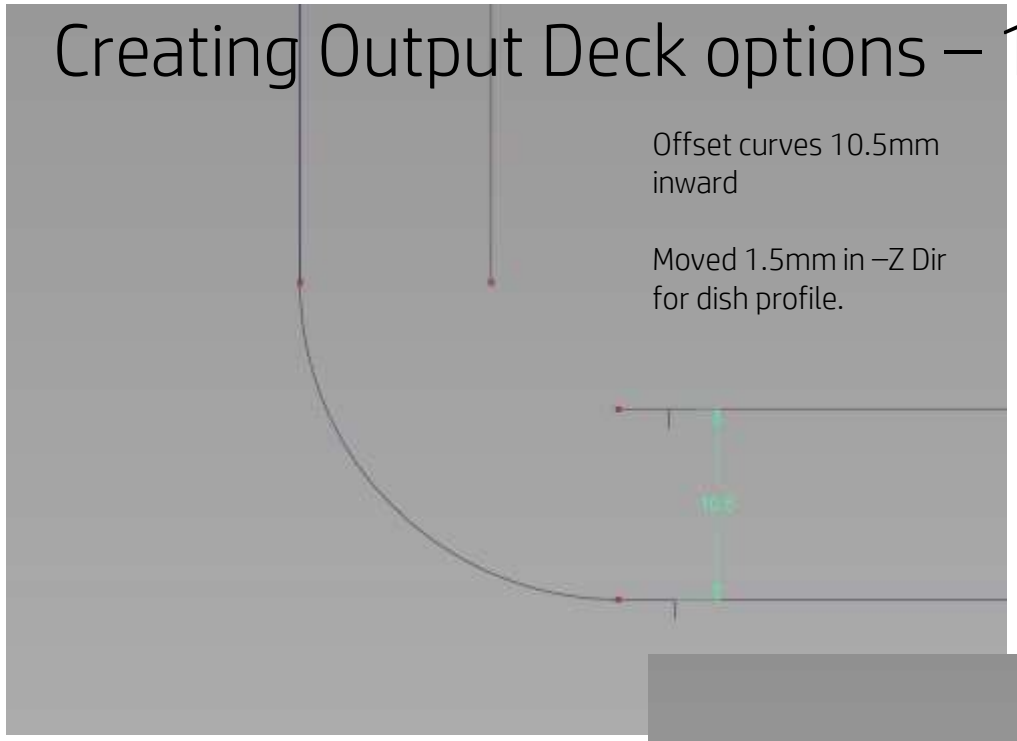


Smaller Radii in front – to optimize 2.4 CGD visual integration

This earlier version had a .35 offset to output deck part. Increasing to .5mm

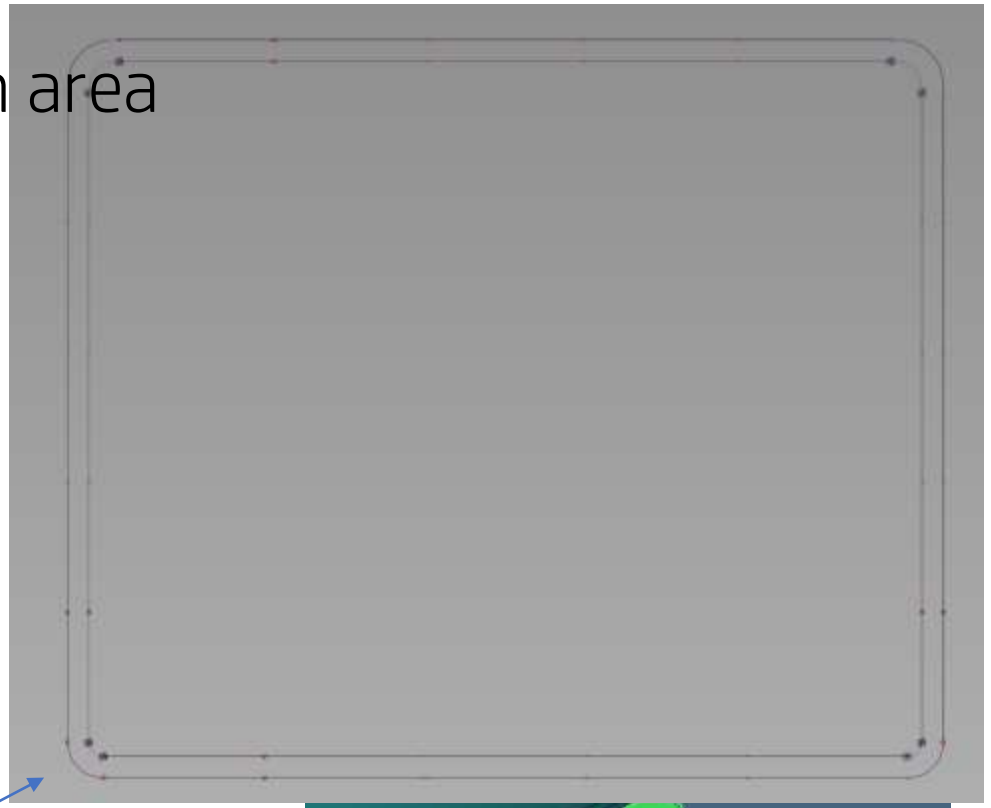
New POR

Creating Output Deck options – 1.5mm deep dish area

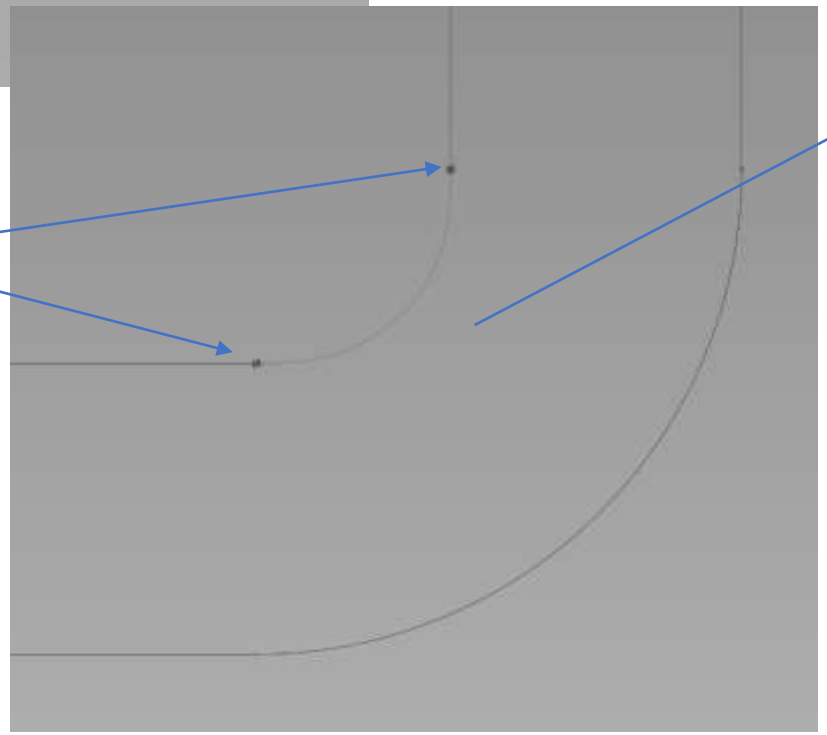


Offset curves 10.5mm inward

Moved 1.5mm in –Z Dir for dish profile.

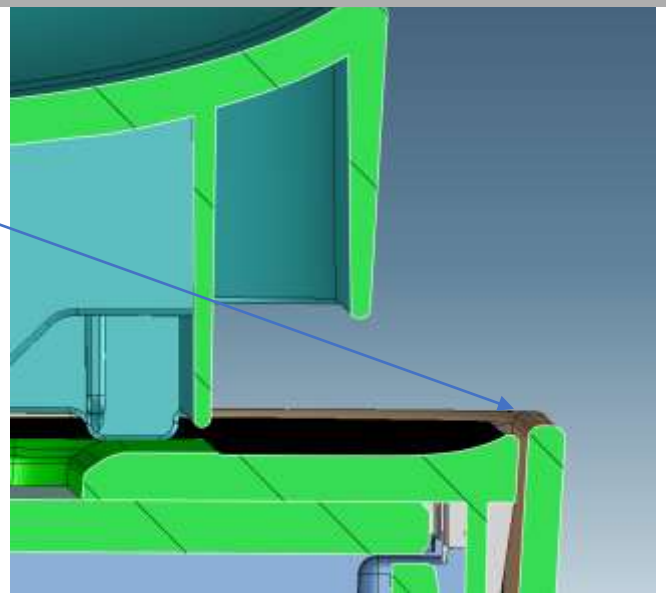


Created a Alias BLEND CURVE (G2) and biased radius to .78 scale on each end (x8).

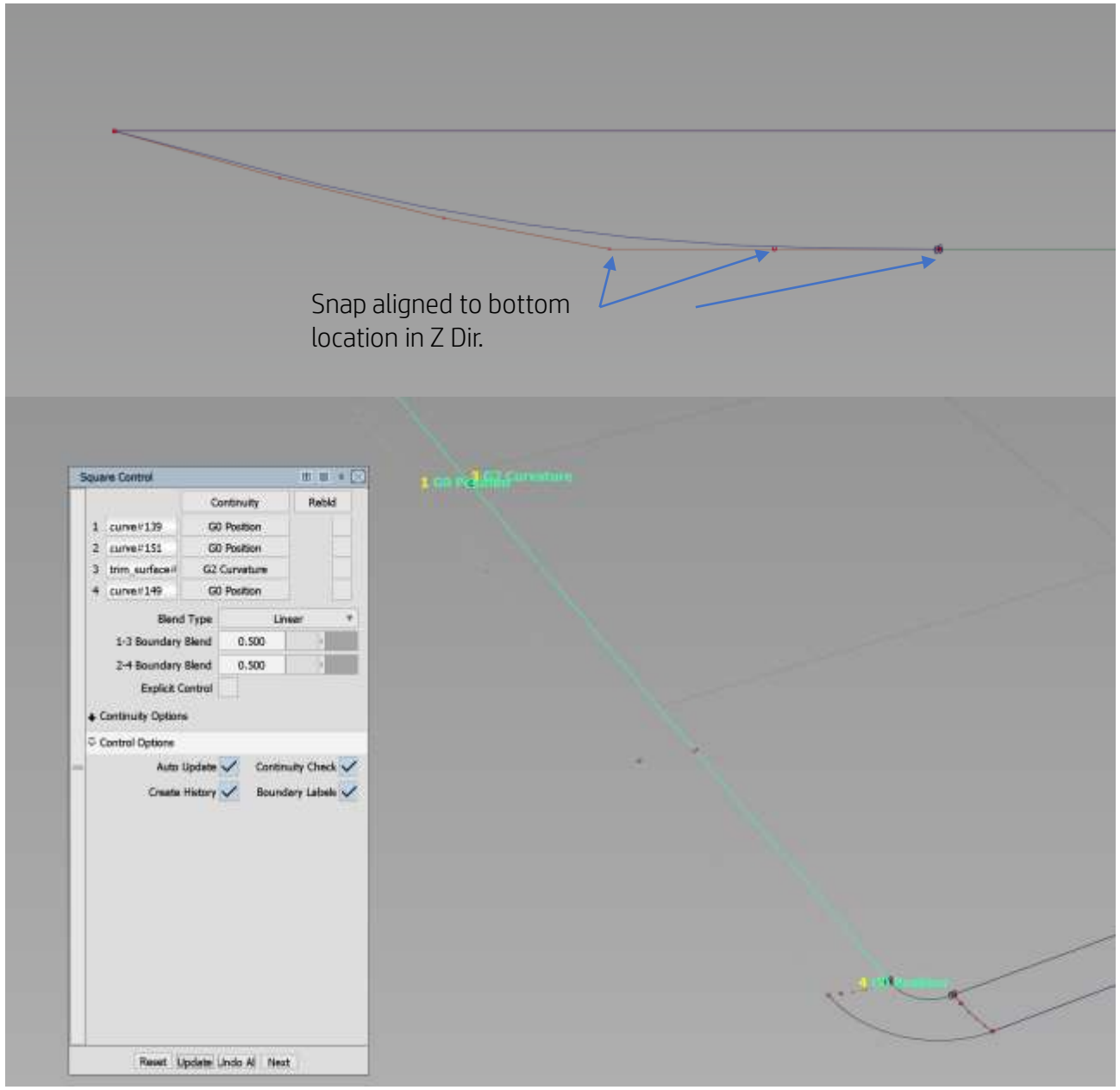


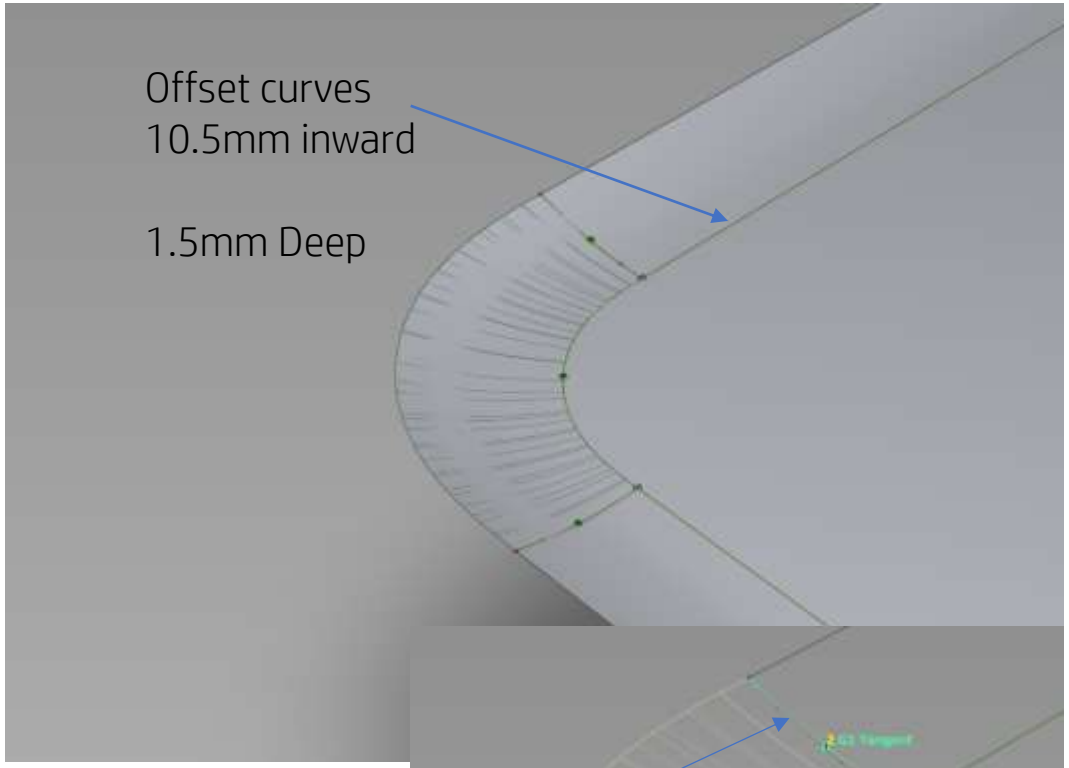
Dish area on Taccola Plus is about 1.25 after adding radius.

Note how top ridge is below base top…

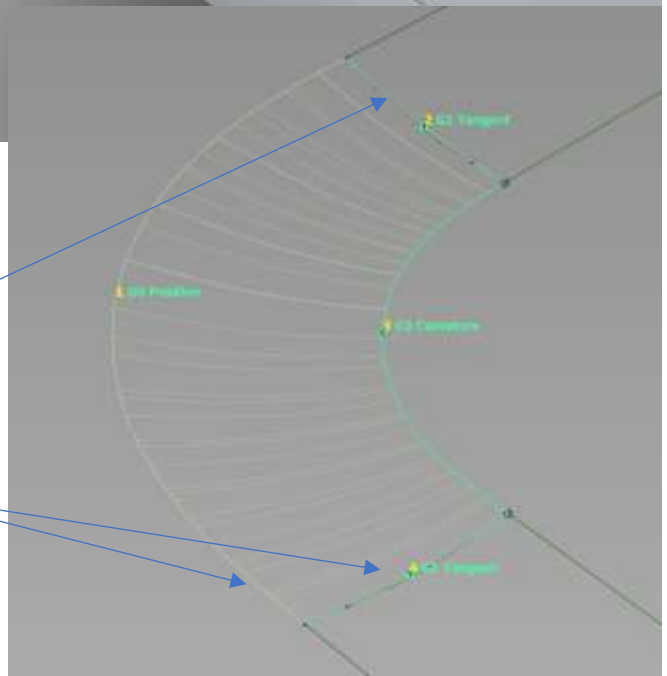


Creating Output Deck options – 1.5mm deep dish area

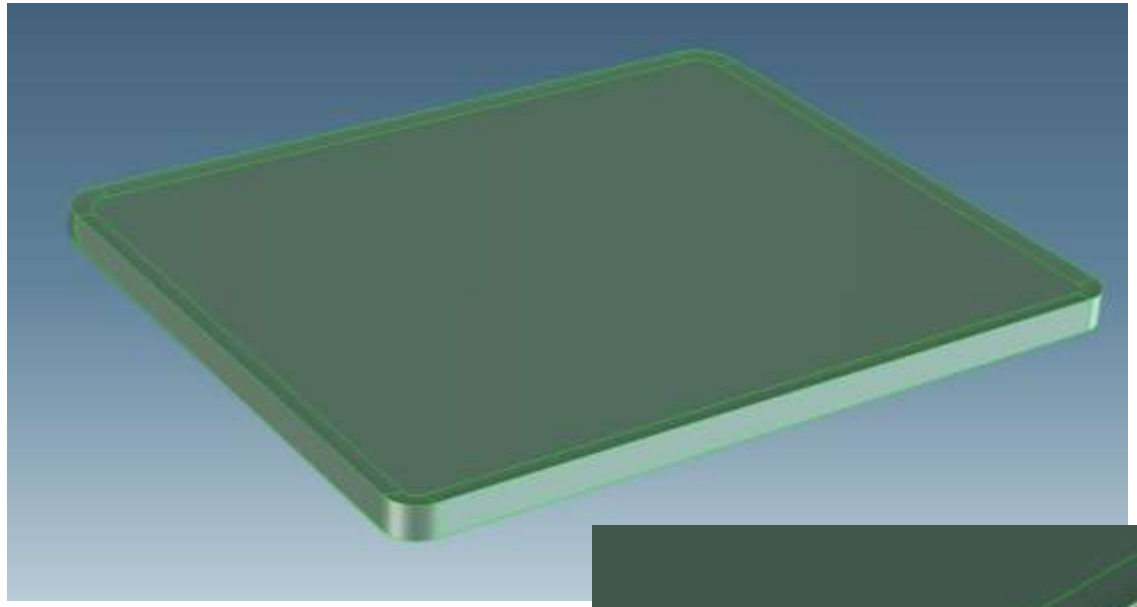




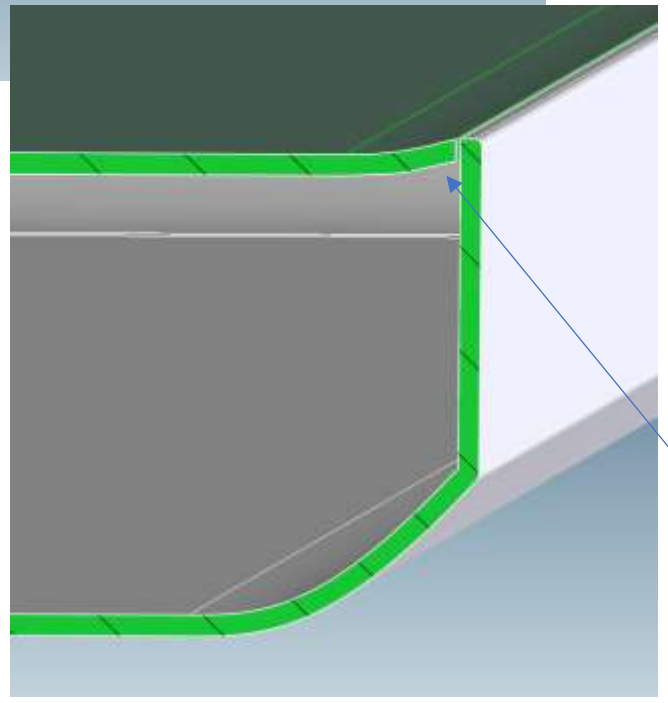
Because I used the outside curve from CREO, it is diff to maintain Curvature continuity these edges – are TANGENT G1



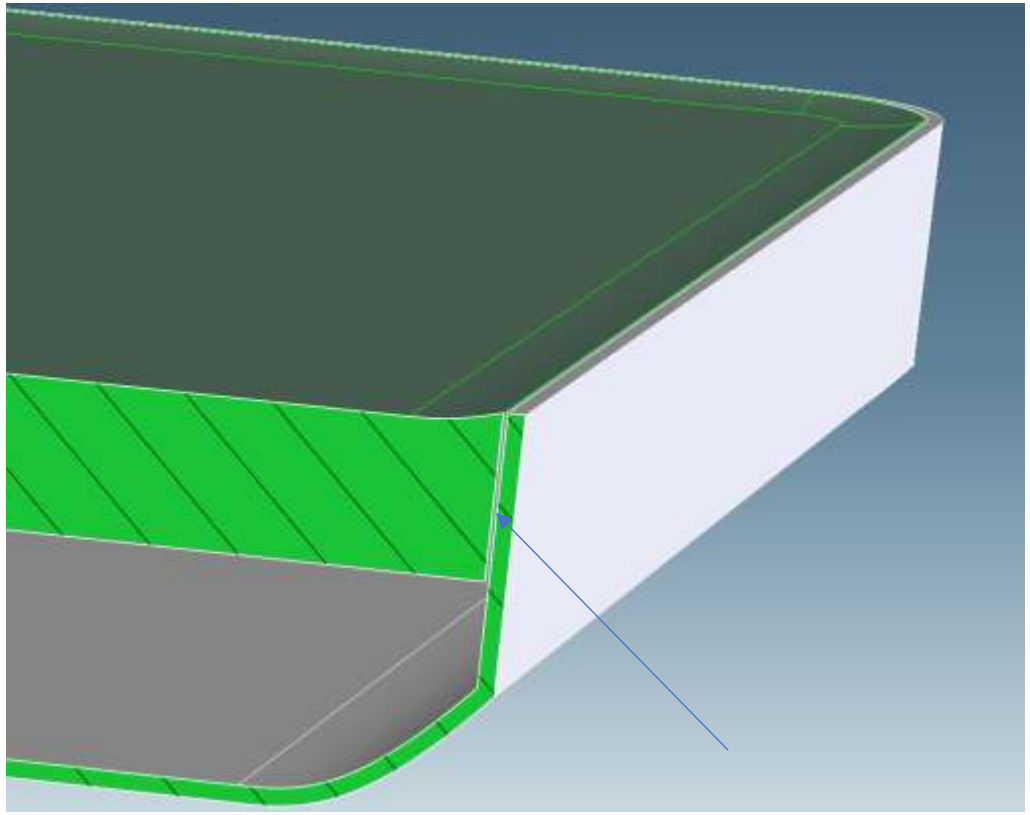
Creating Output Deck top – 1.5mm deep dish area



Imported top faces and PULLED/extruded to 3D Body. Then punched a straight bottom.



Shelled part to create 2mm thick part without protruding sides…

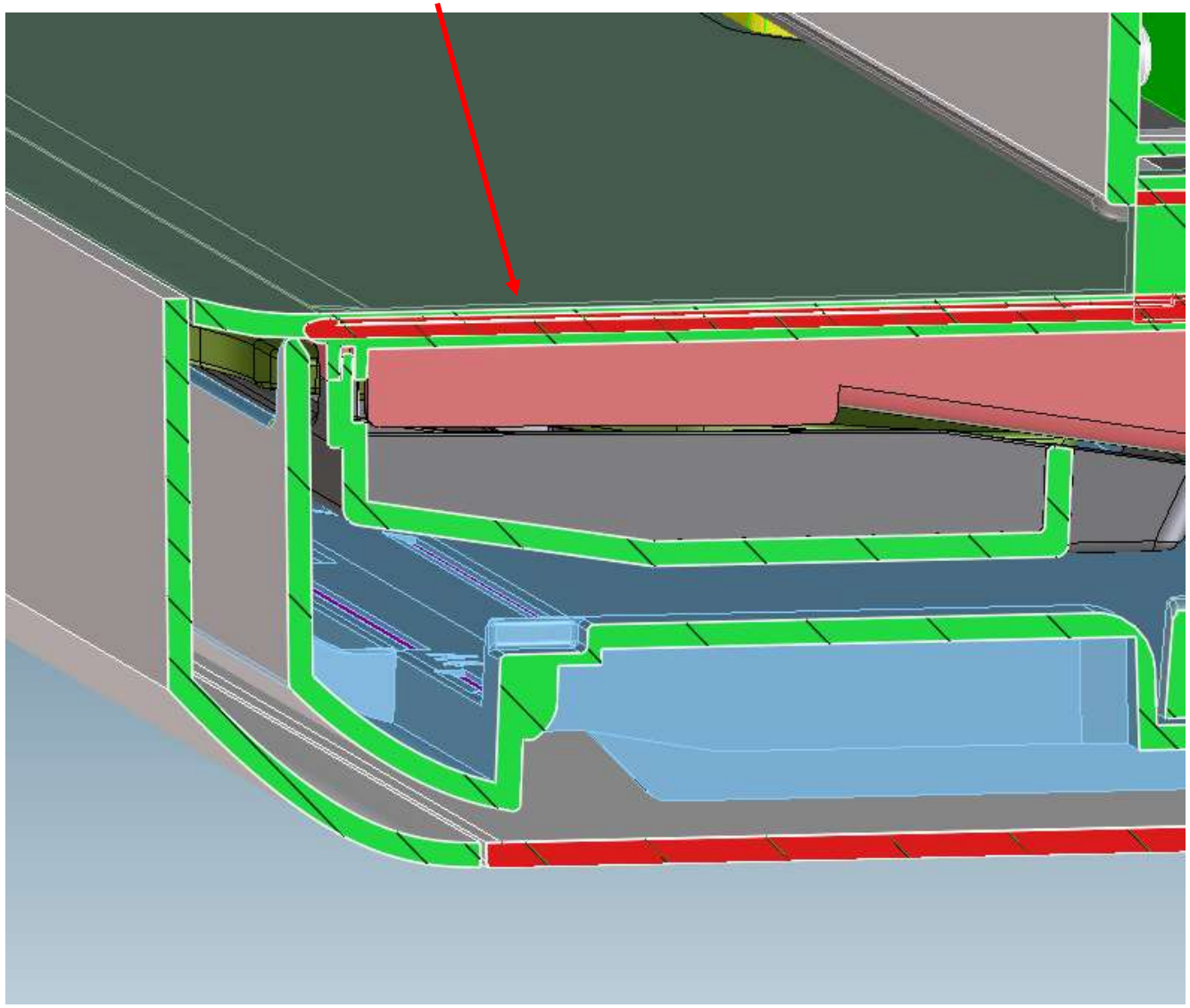


Used ADVANCED TAPER to add 2 degrees draft on sides of Output Deck part.
Part is offset from base .5mm

Output Deck – Rev2c – is .4mm higher than Vasari output-deck

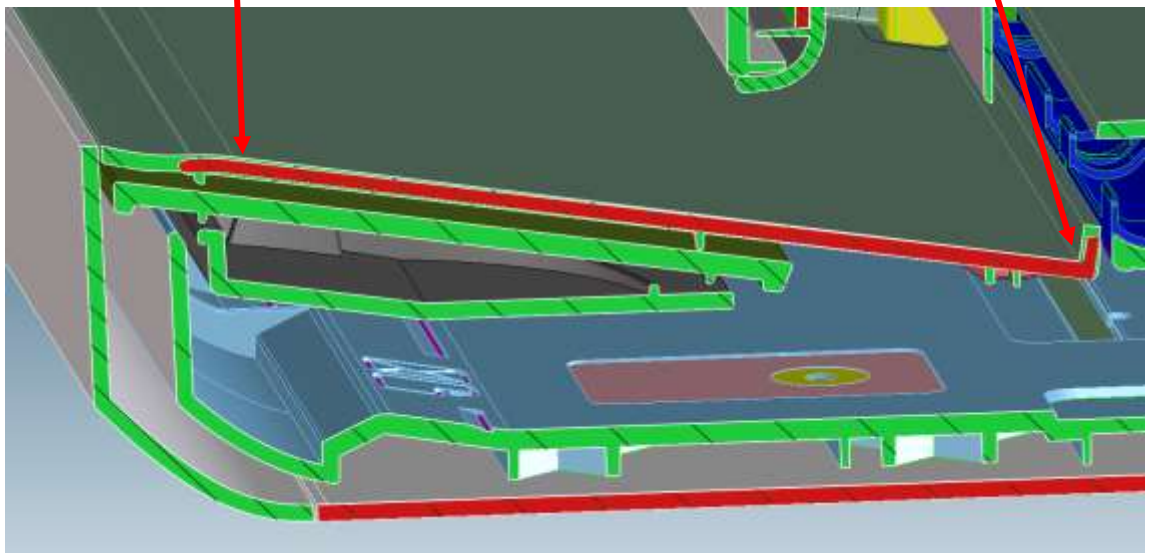
NOT POR
See other version

Flat area is exactly .4 mm higher than Vasari



About .25 higher in front vs Vasari

Output tray is same level in rear – common edge with Vasari

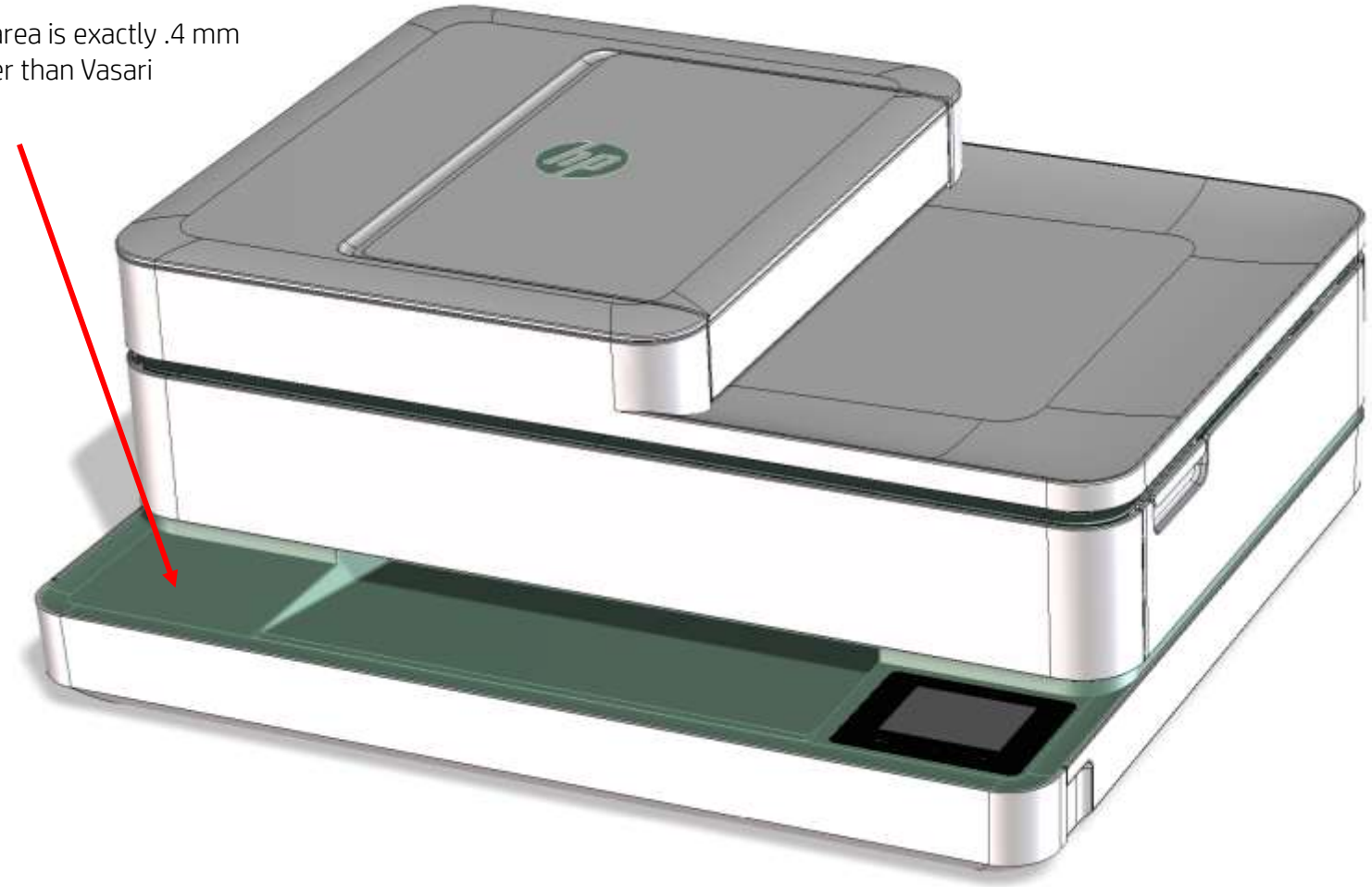


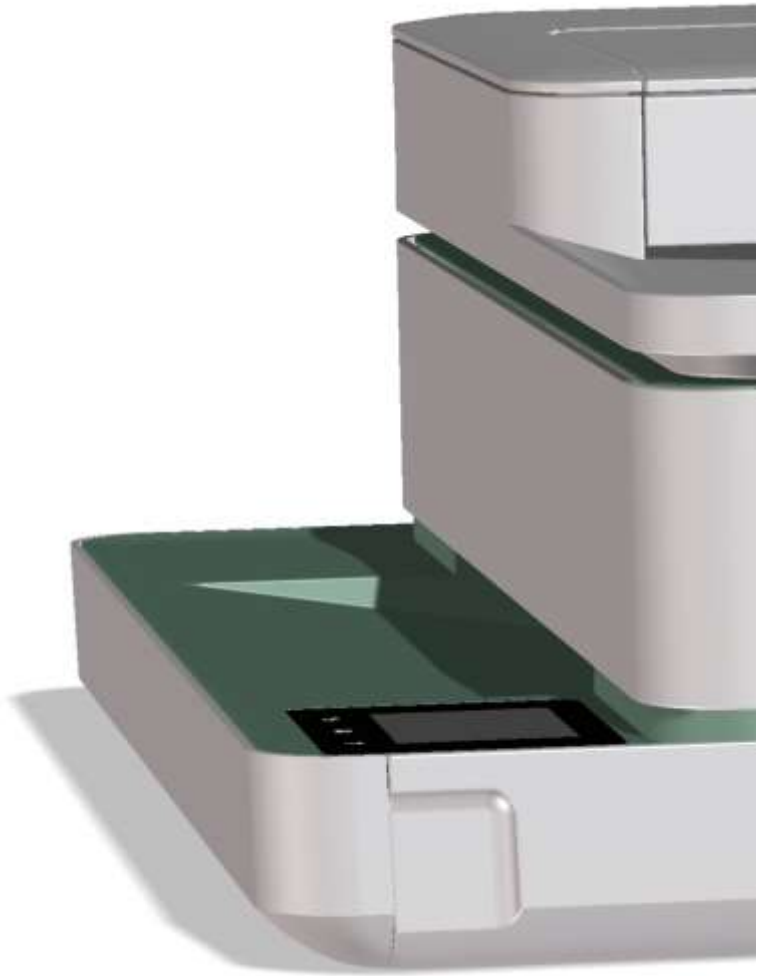
Output Deck – Rev2c – is .4mm higher than Vasari

NOT POR
See other version

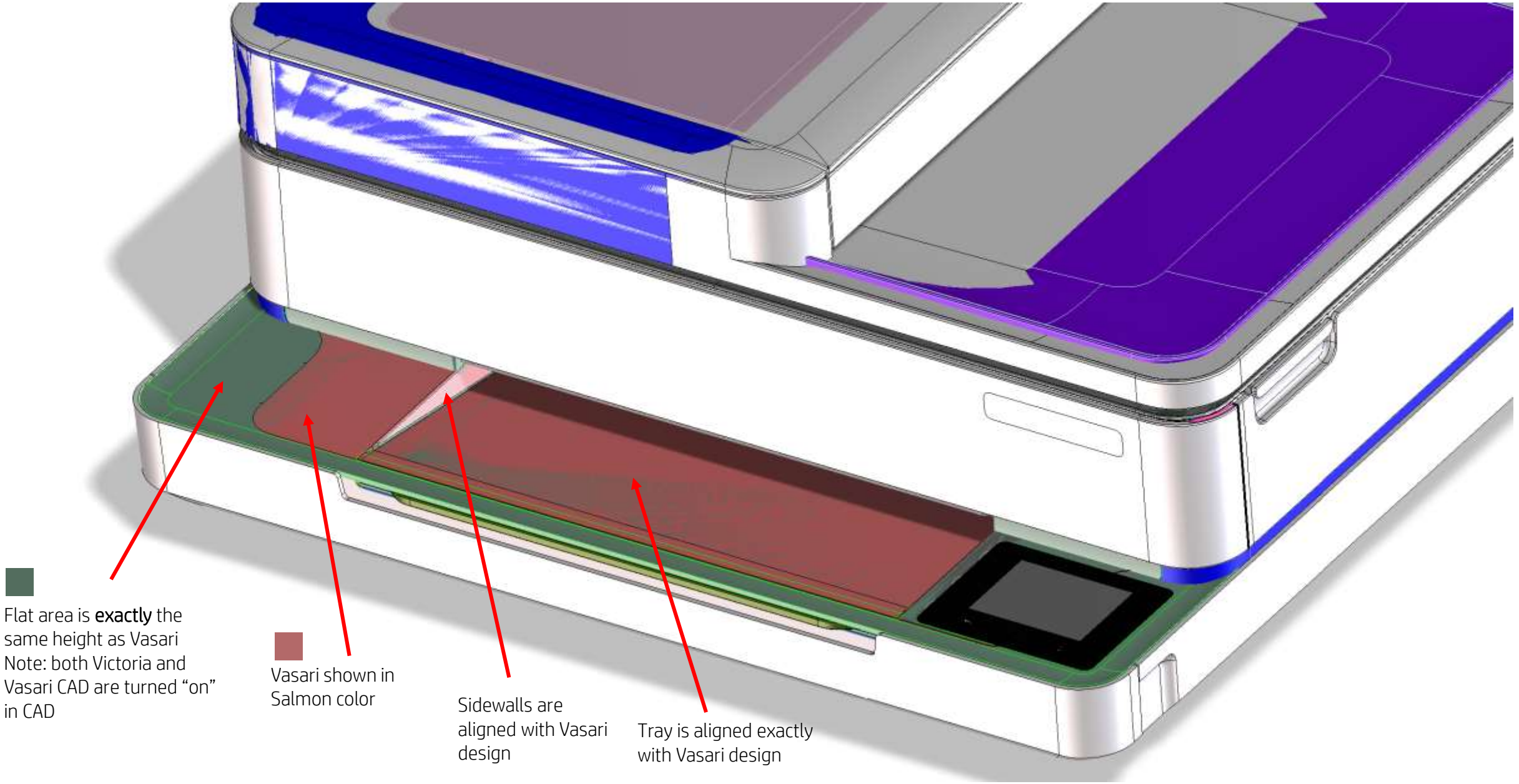
If we need additional room above Vasari output deck height we can discuss, and I can modify as needed…

Flat area is exactly .4 mm higher than Vasari





Output Deck – Rev3 – has same tray surfaces as Vasari

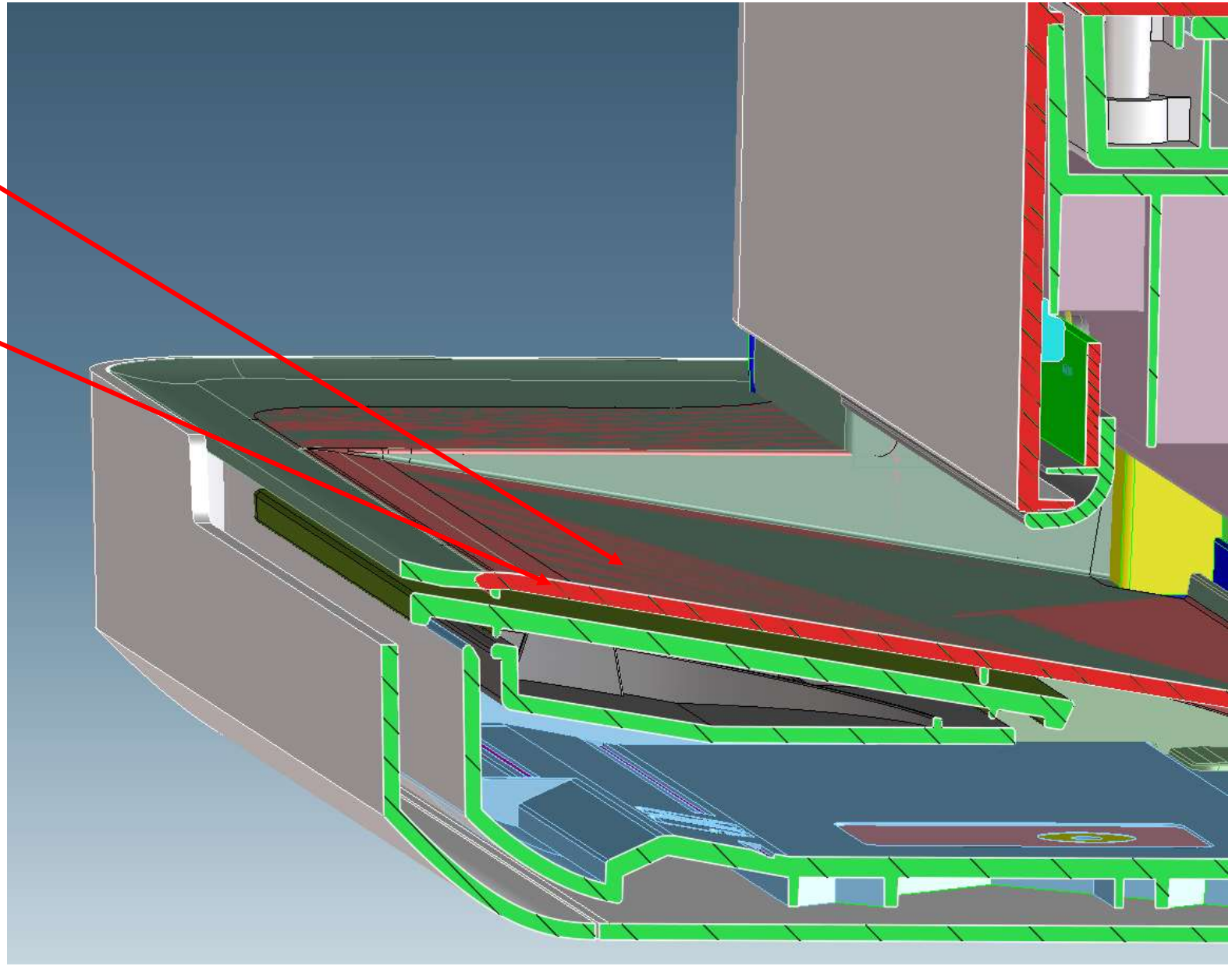


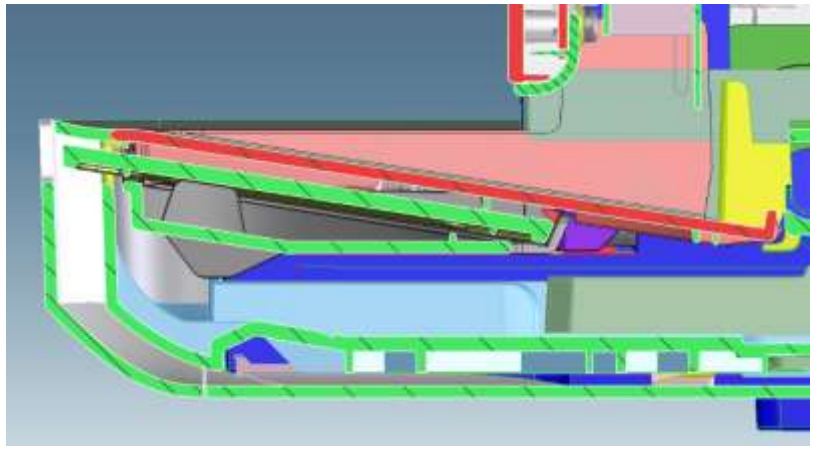
Output Deck – Rev3 – has same tray surfaces as Vasari

Cut-away of BOTH Victoria and Vasari parts

Tray is aligned exactly with Vasari design

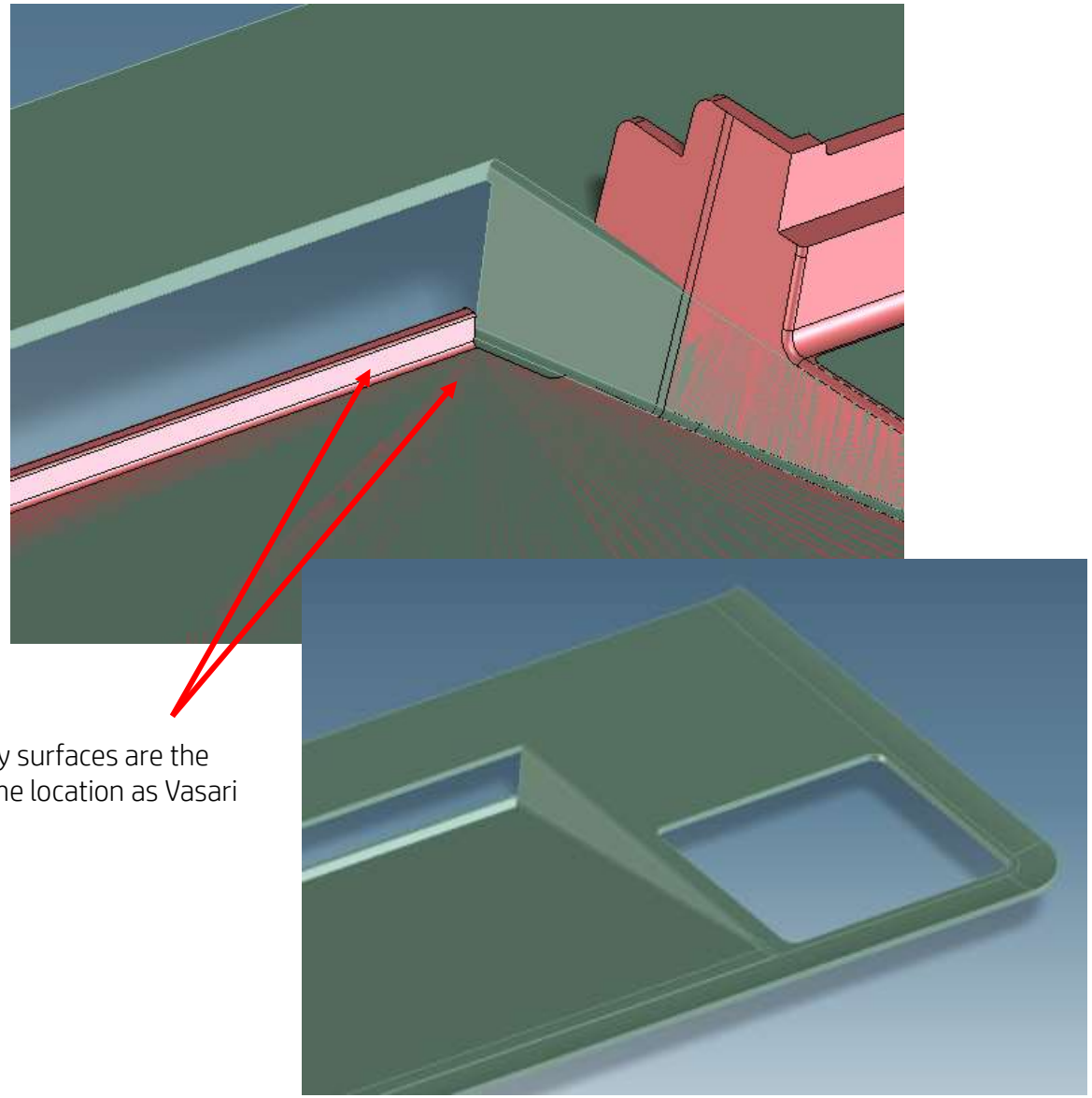
Vasari shown in Salmon color
Tray cut-away in red color



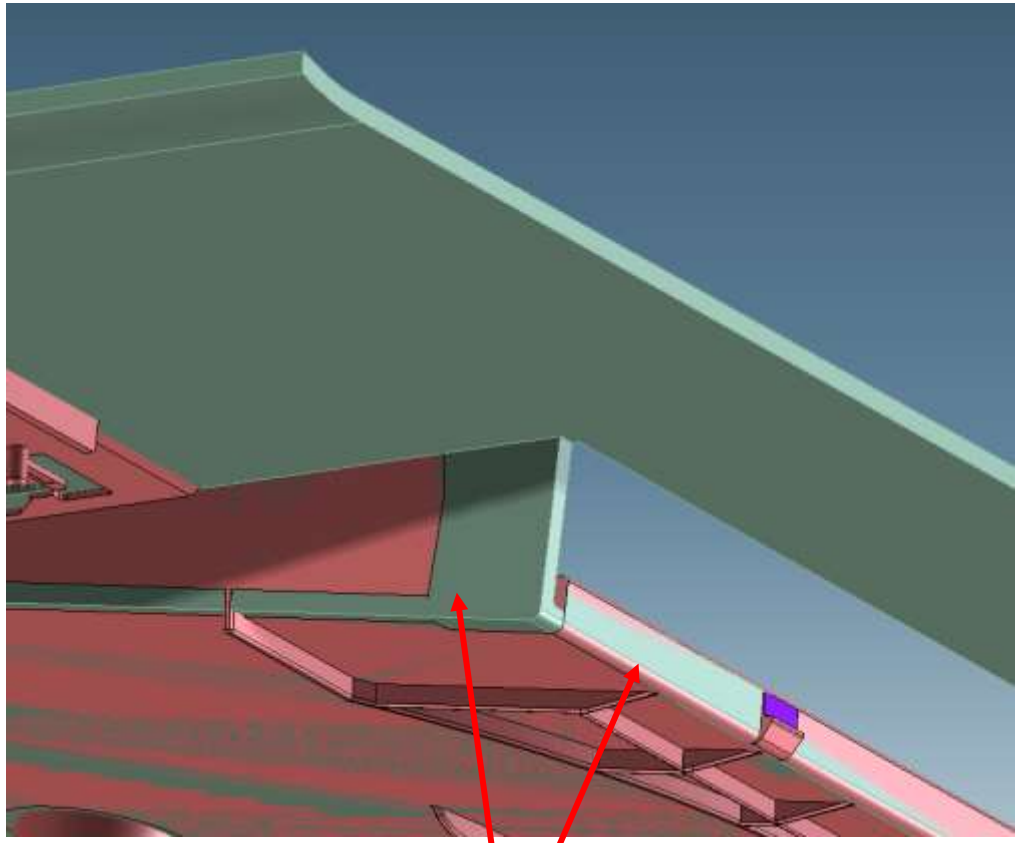


Output Deck – Rev3 – has same tray surfaces as Vasari

Output Deck – Rev3 – has same tray surfaces as Vasari

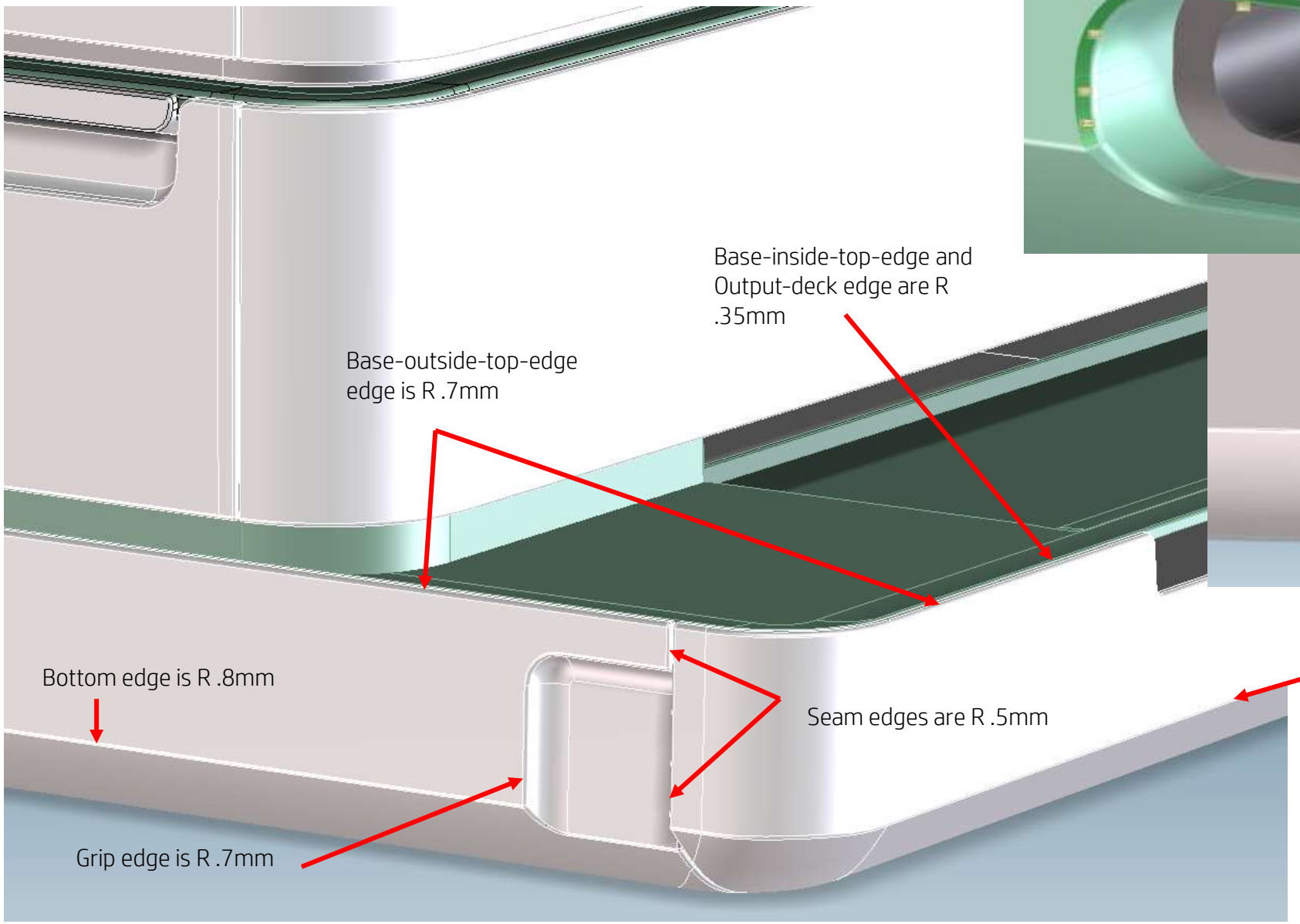


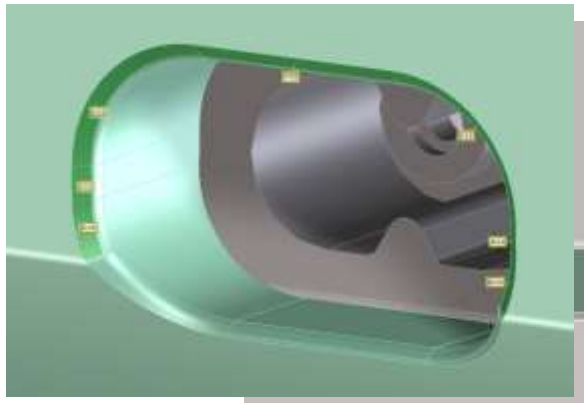
Tray surfaces are the same location as Vasari

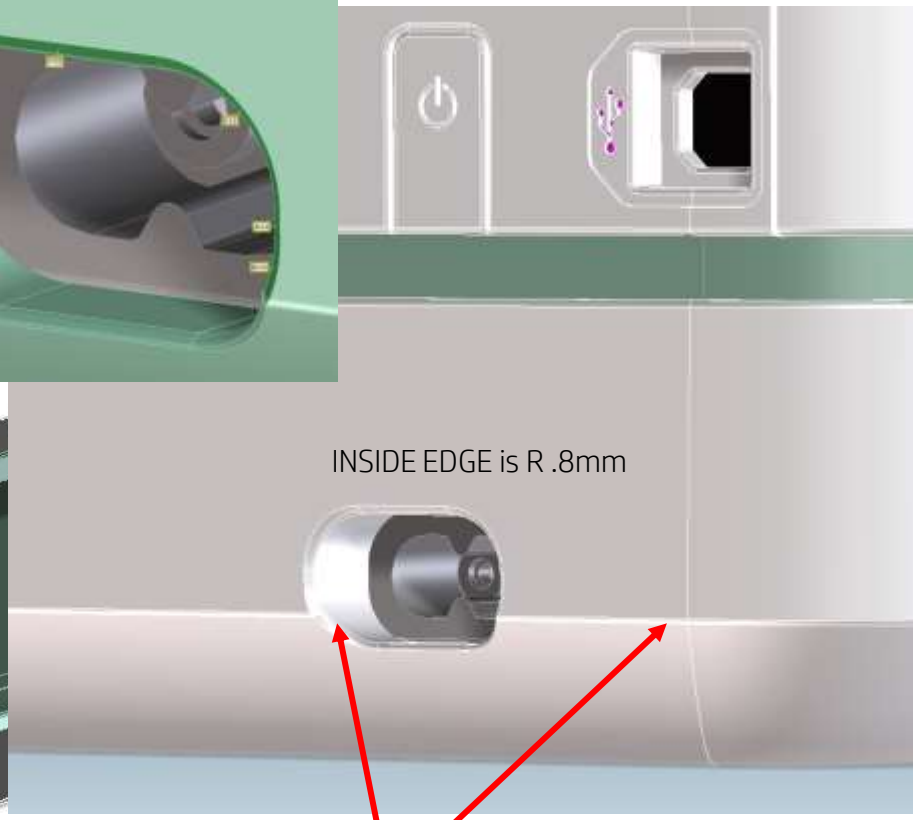


Underside of tray:
Tray surfaces are the same location as Vasari

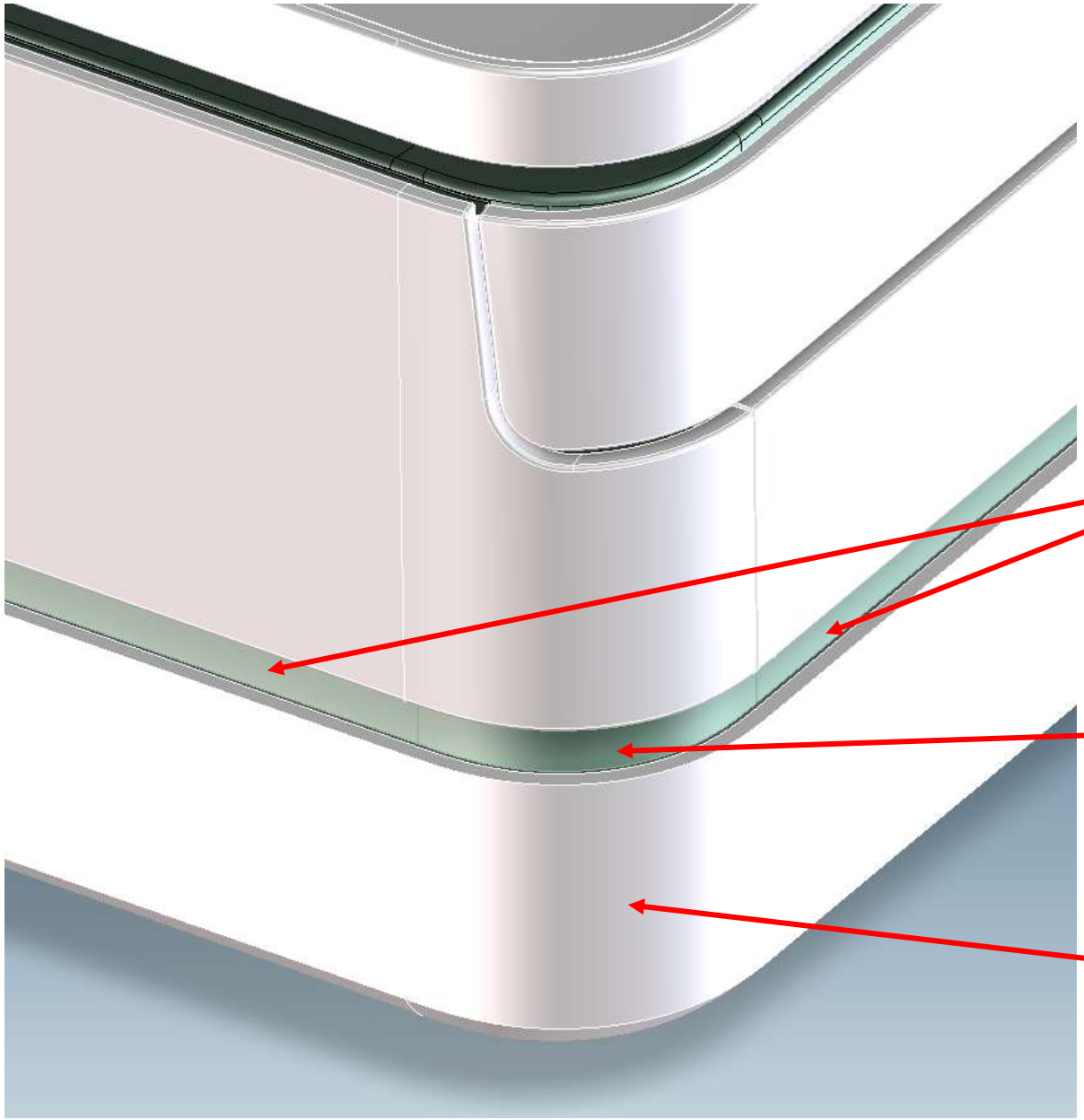
RADII on duplicate CAD part – can add after internal features are added…







Output Deck – Rev3 – Accent color in recess



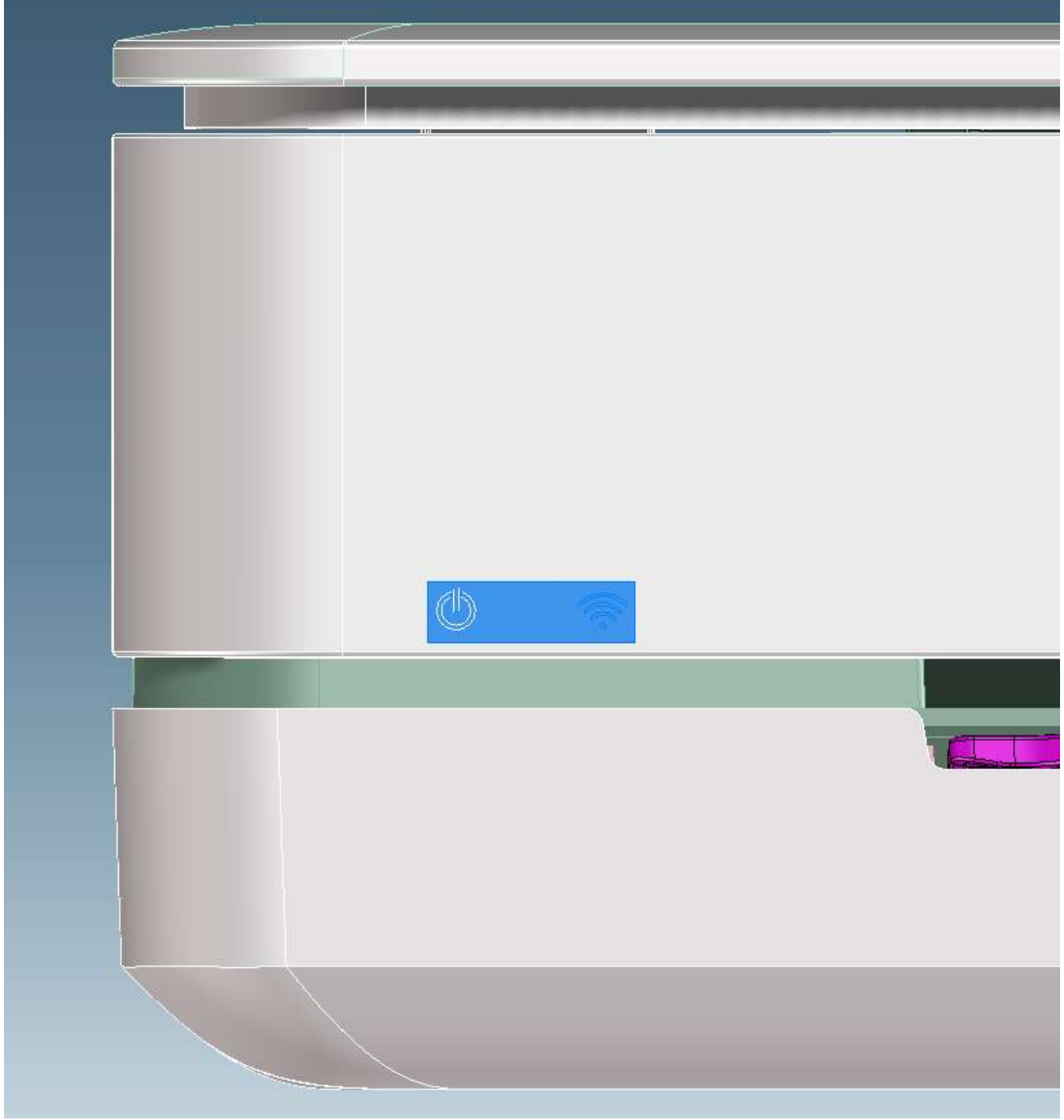
Back corner shown

R&D can this part to create
three small accent color parts.

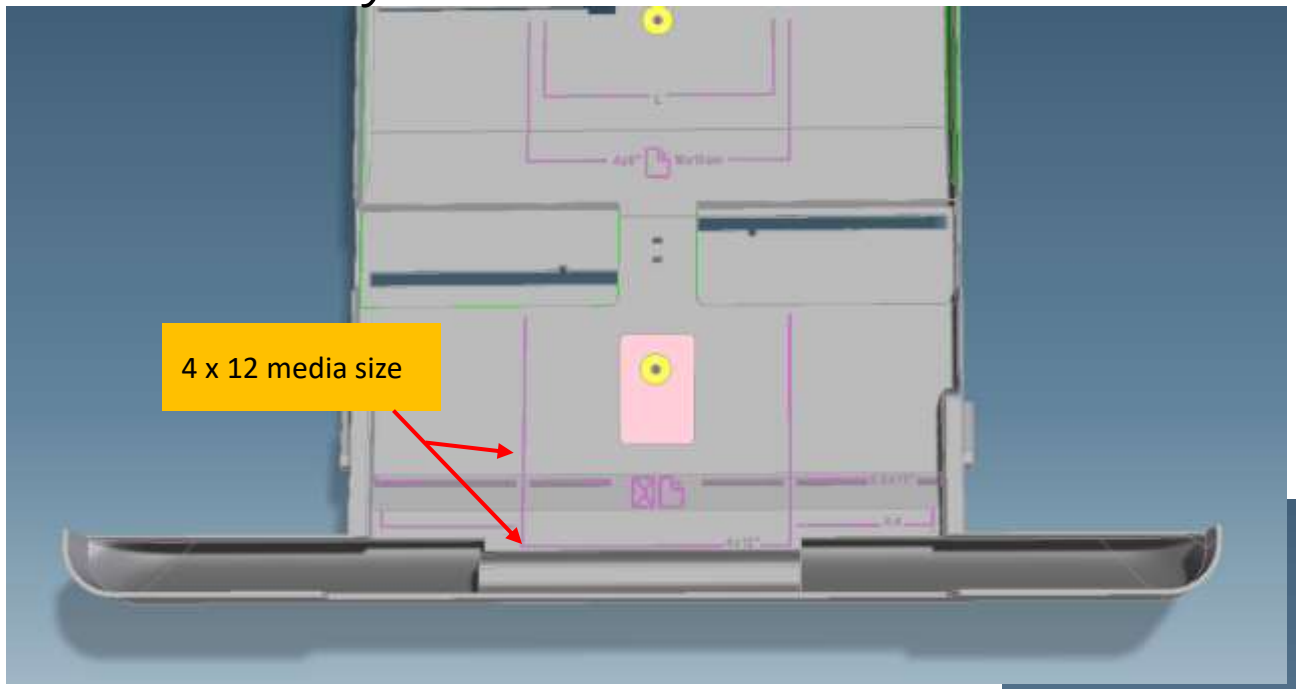
Radius is 25.5mm
Curvature Continuous

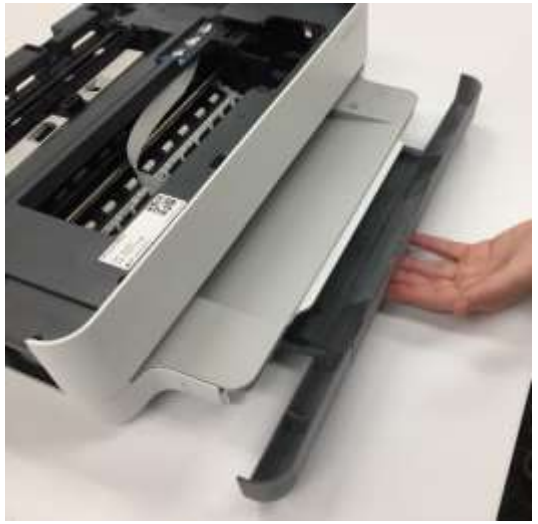
Radius is 28mm
Curvature Continuous
And drafted

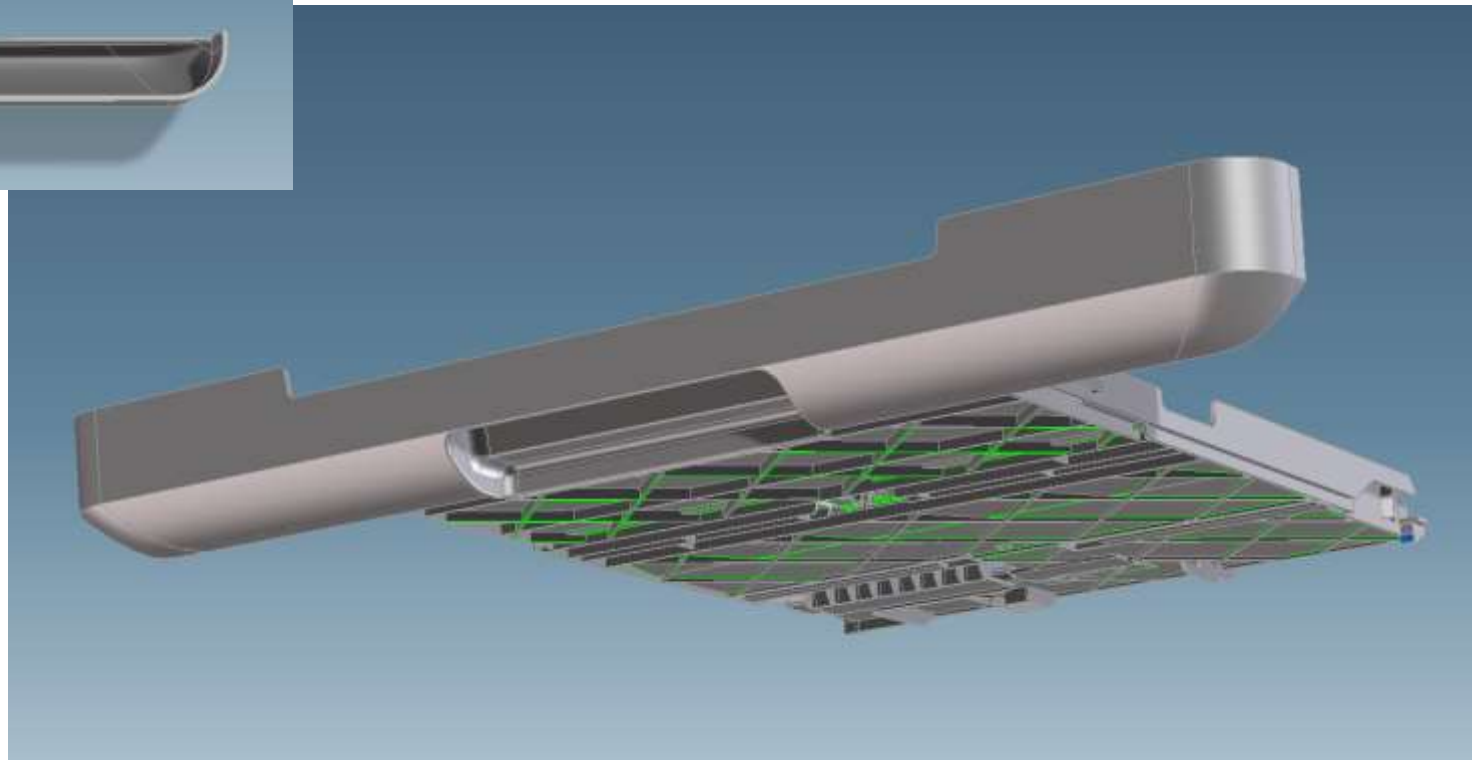
Distance from bottom edge = ?
Concern with debossed icons and tool fill uneven wall thickness



Front Tray Pull



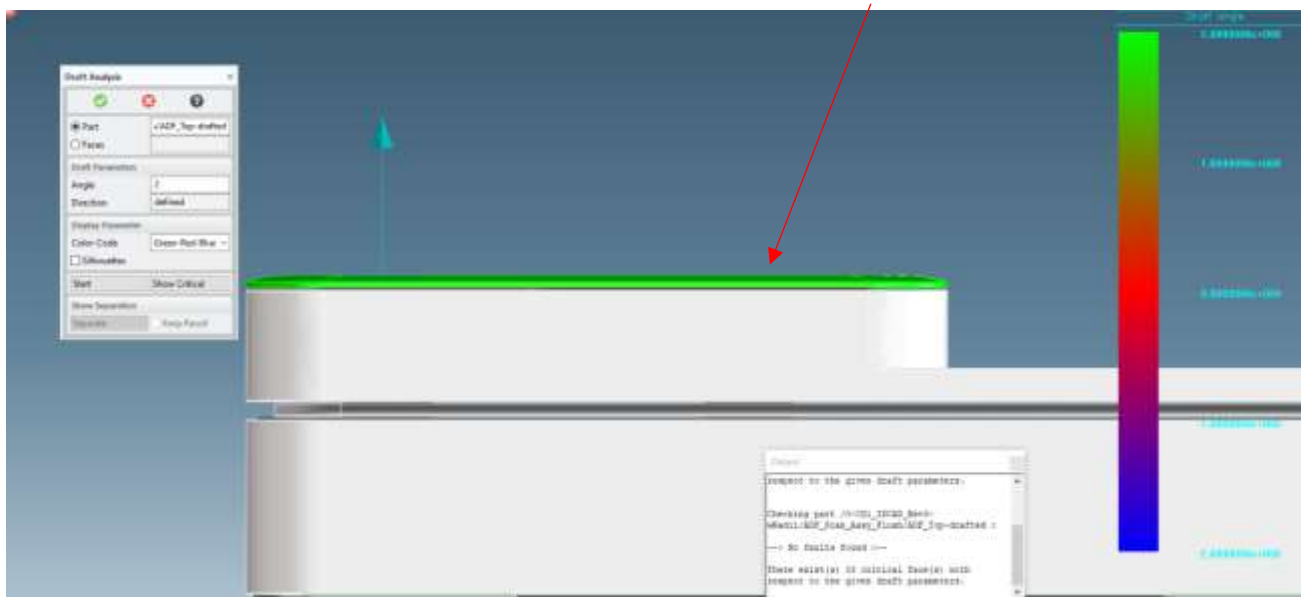


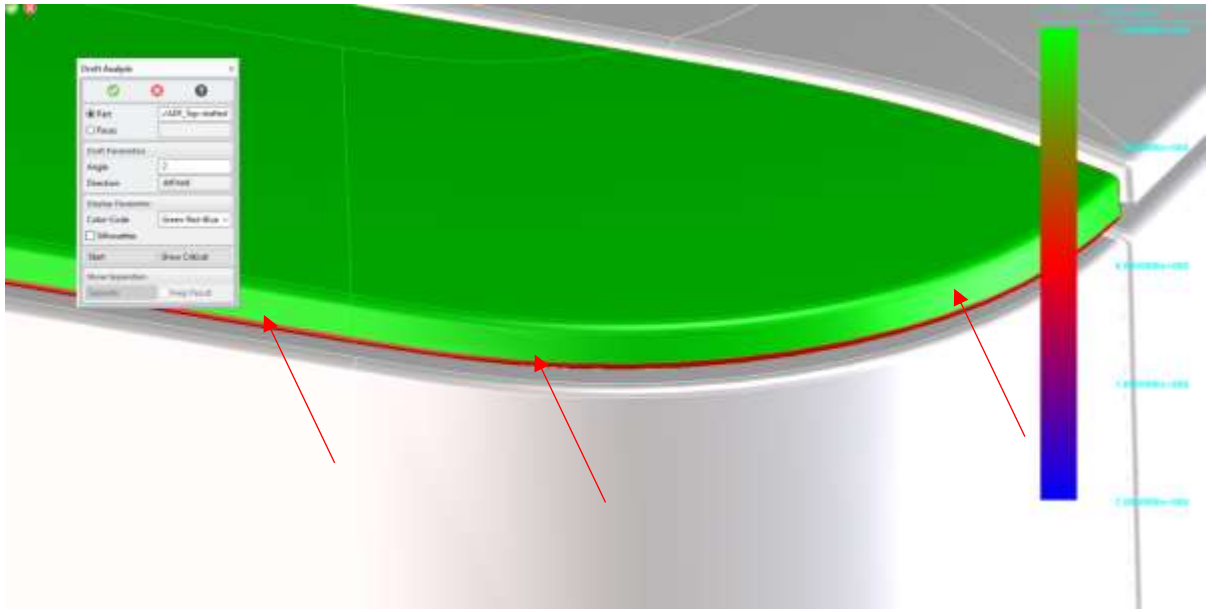


ADF CAD Log

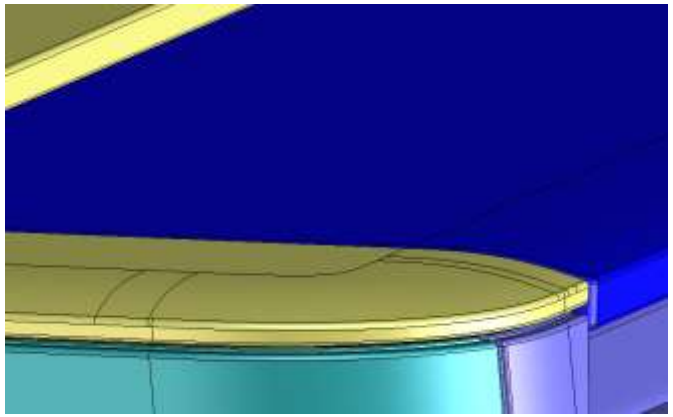
ID - ADF CAD – added draft to top…

Added 2 degrees draft to sides of ADF top part…





Noticed Tacolla Plus is drafted 3 deg.

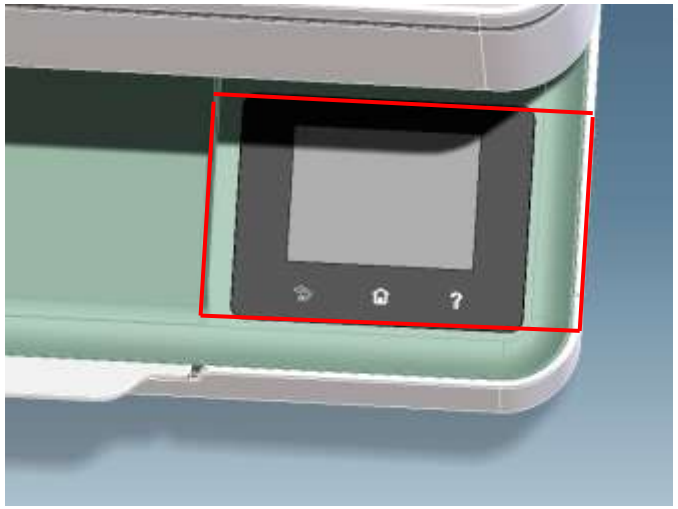


Next steps:

2.7 CGD CAD

Cecilee working on concepts for control panel and lift affordance.

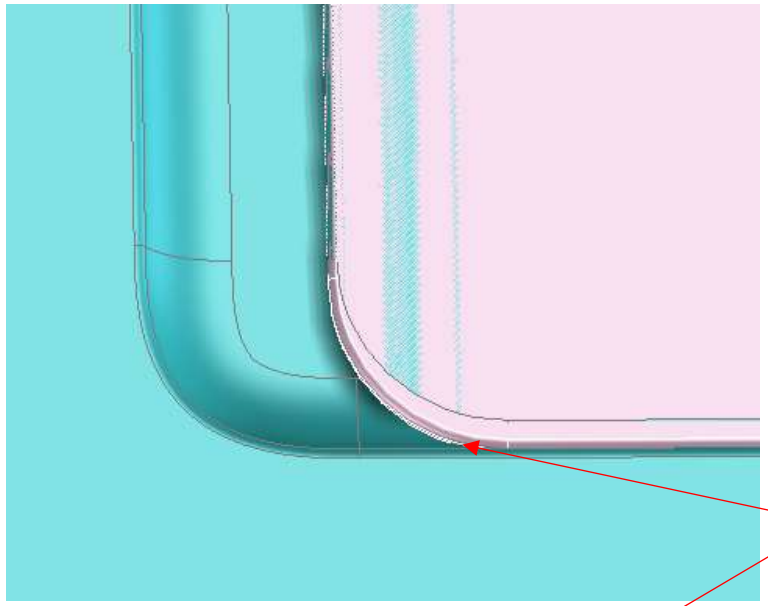
- Not sure on dish vs no dish on output deck
- Assume same, smaller 20mm radii on front edge…



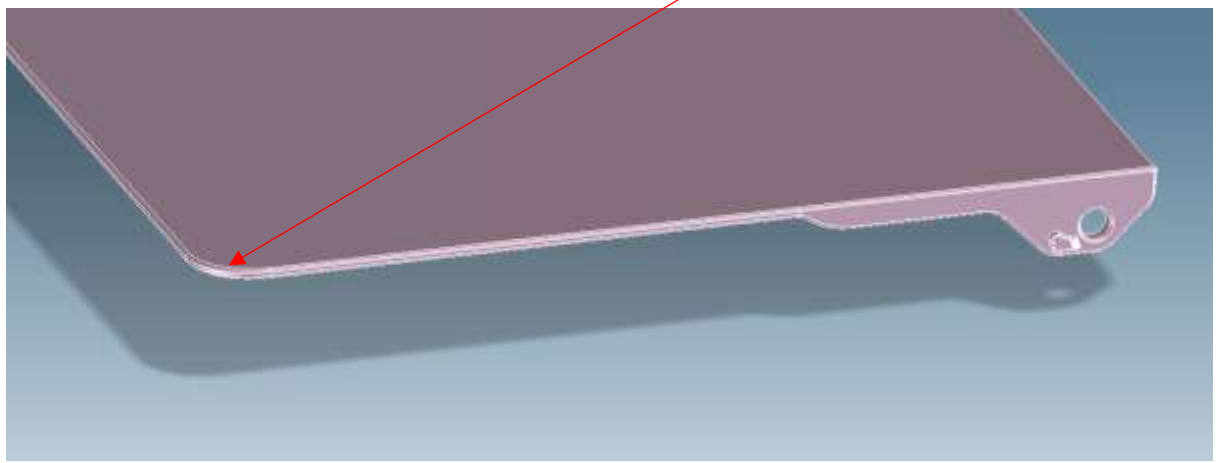
“In parallel: CD1 w/ 2.7 CGD
Working on additional options for a manual lift articulating display

ADF – Input Tray – CD1 March 2nd, 2022

Sayan ADF Input Tray

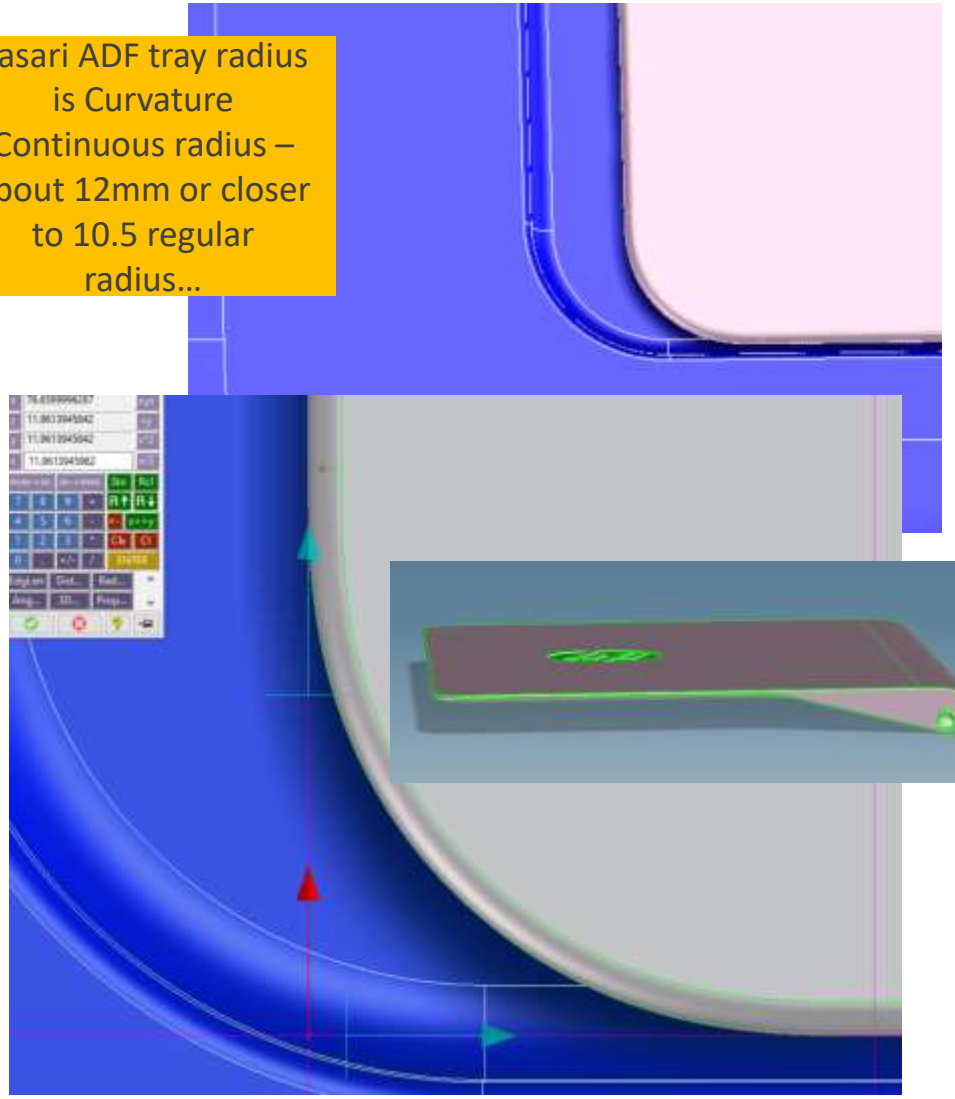


R 10.34



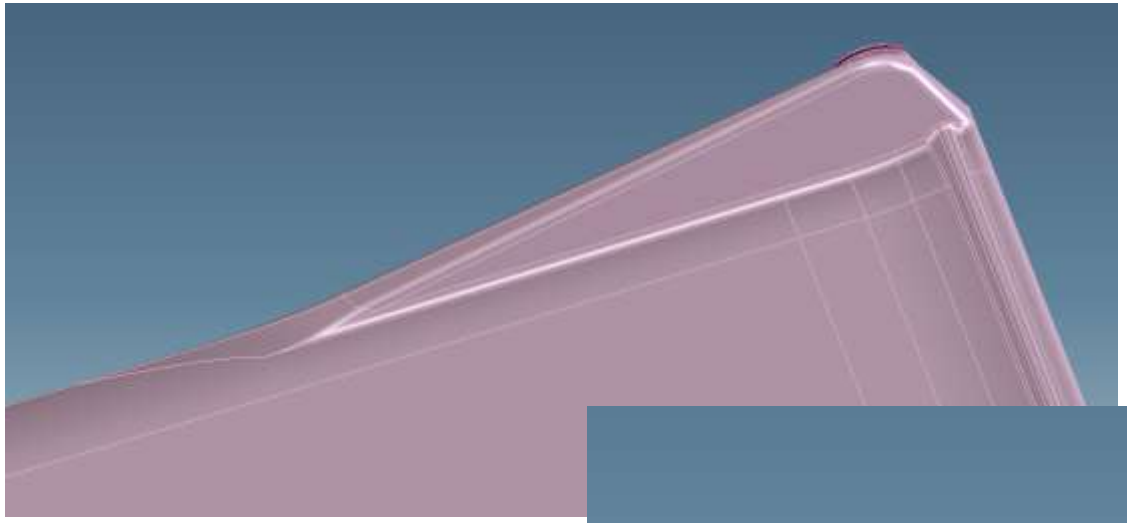
Vasari ADF Input Tray

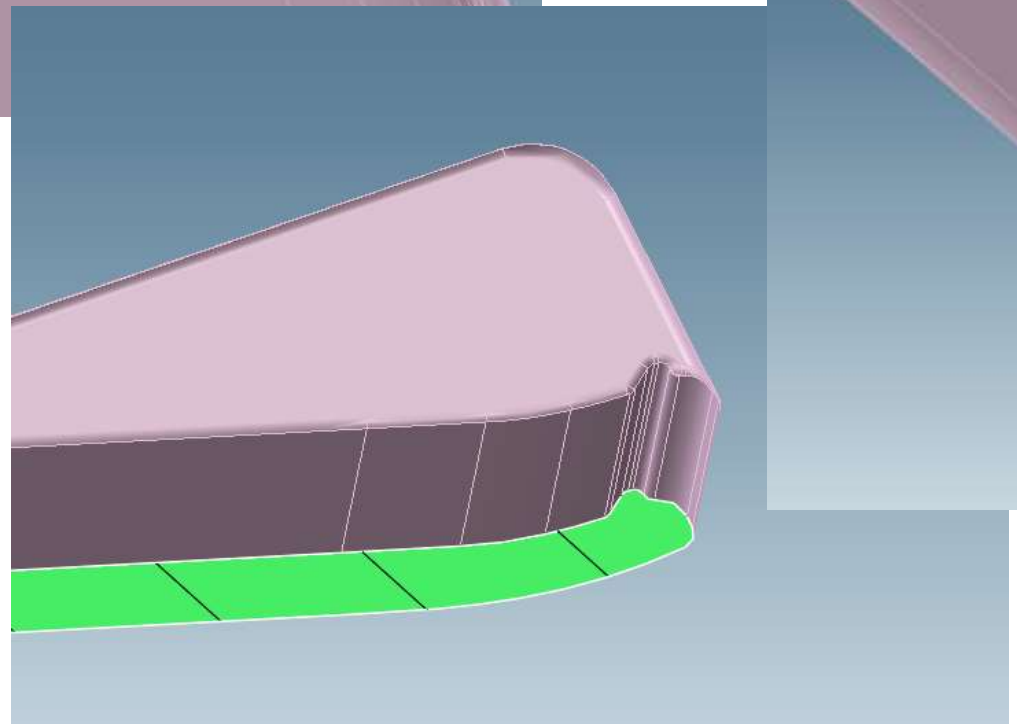
Vasari ADF tray radius is Curvature Continuous radius – about 12mm or closer to 10.5 regular radius…

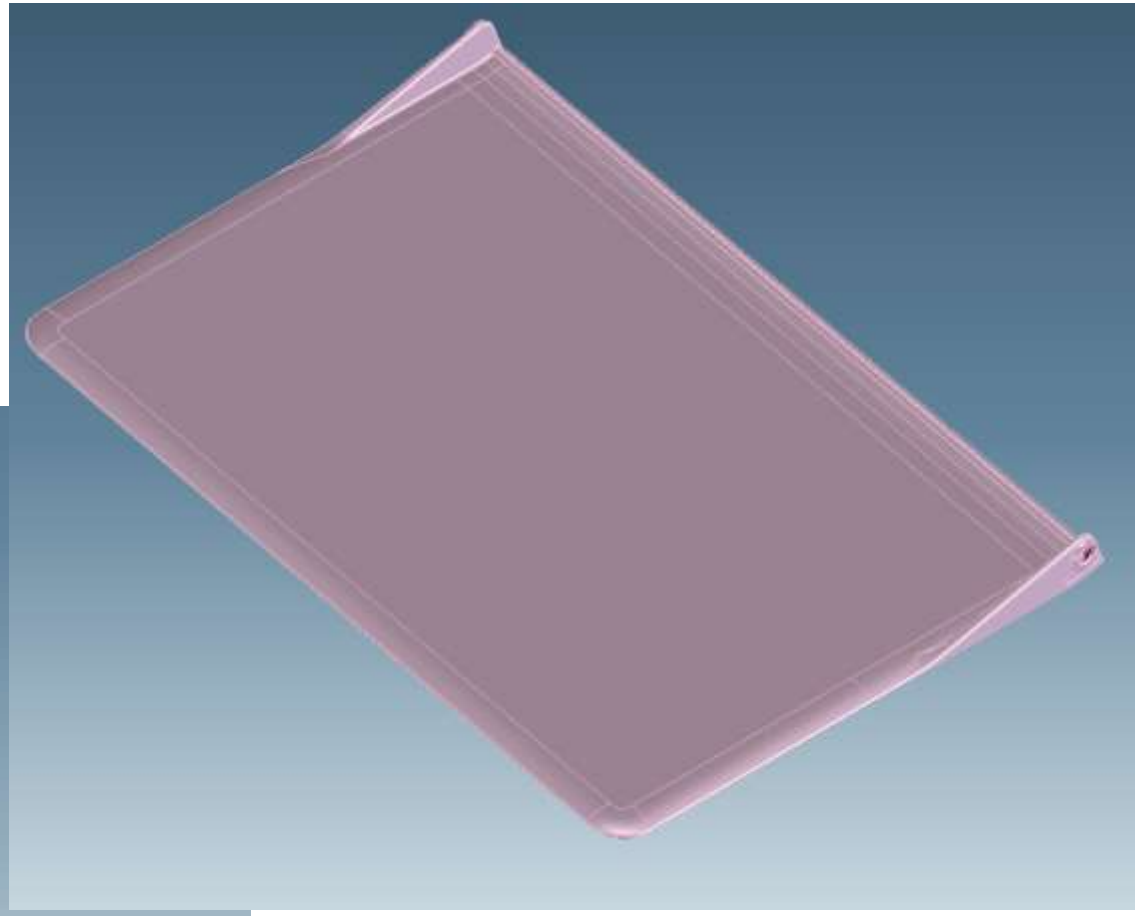


ADF – Input Tray – CD1 March 2nd, 2022

Vasari ADF Input Tray

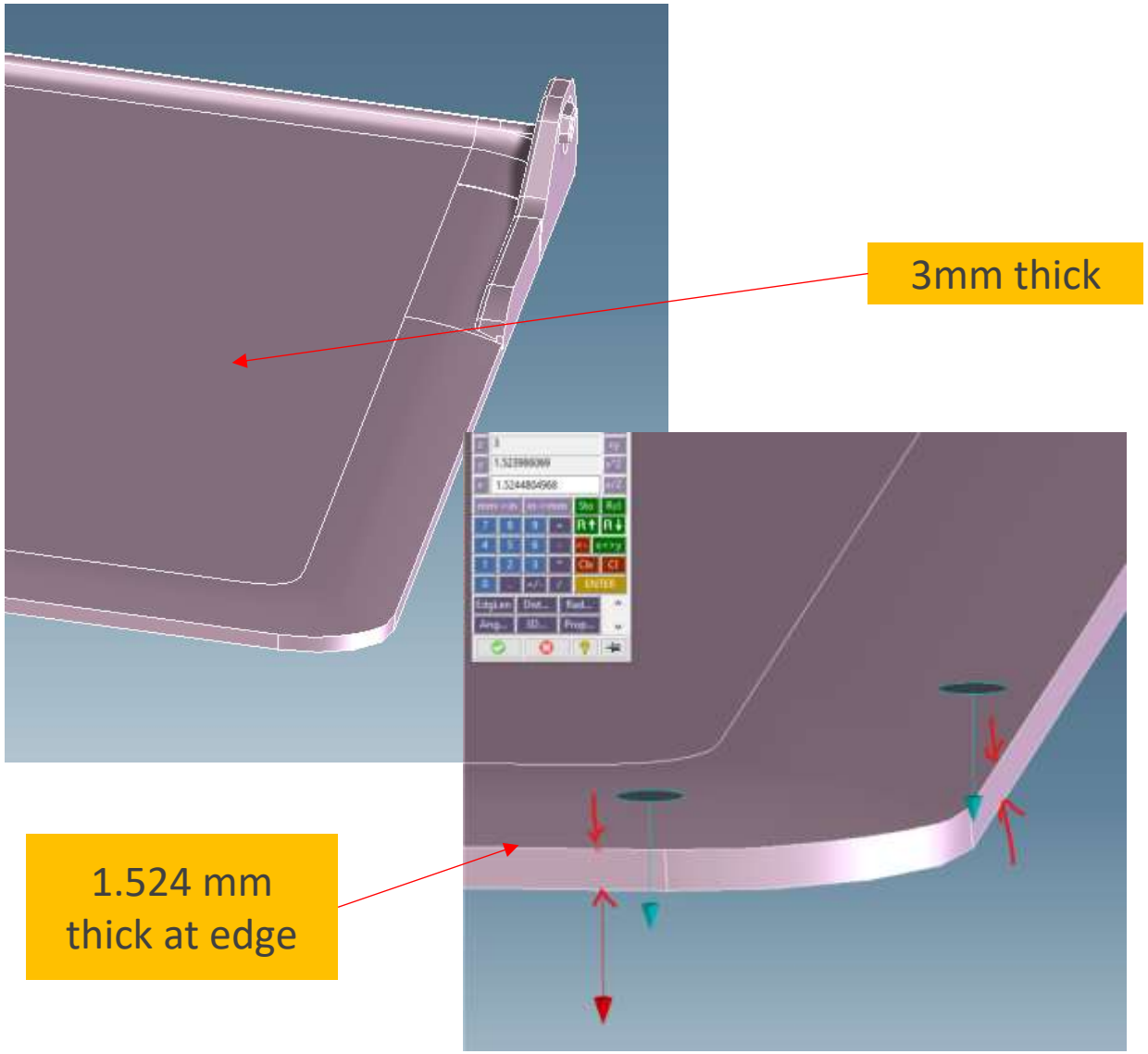


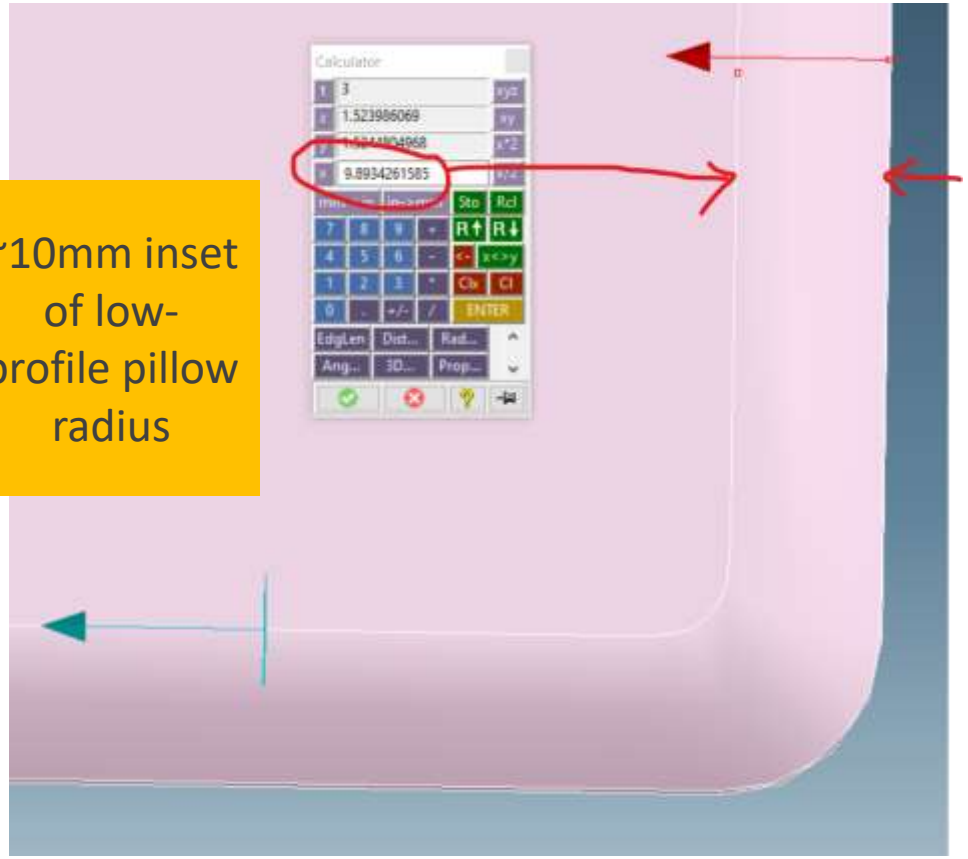




ADF – Input Tray – CD1 March 2nd, 2022

Sayan ADF Input Tray



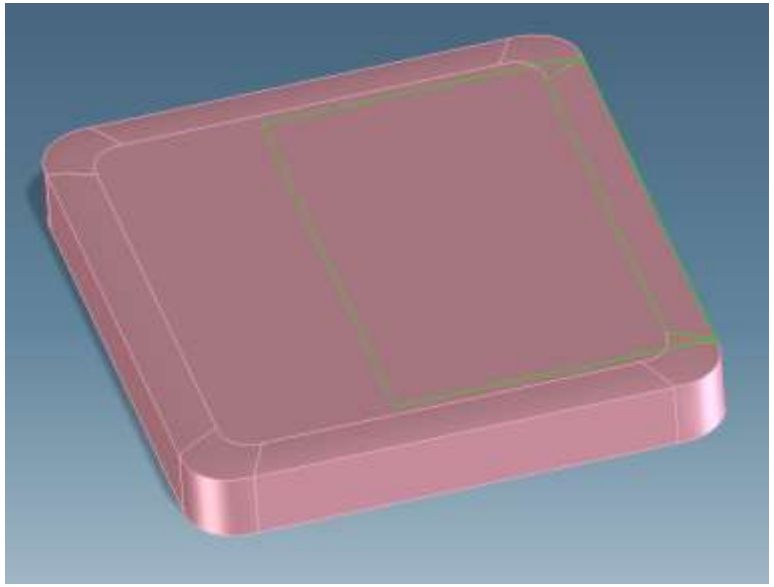


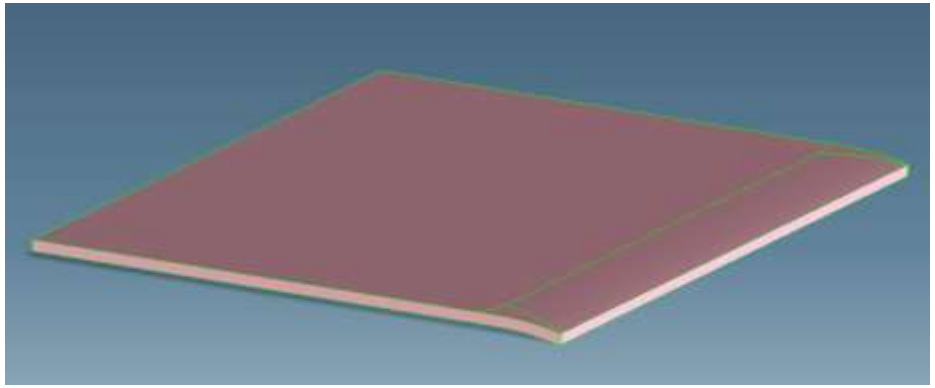
ADF – Input Tray – CD1

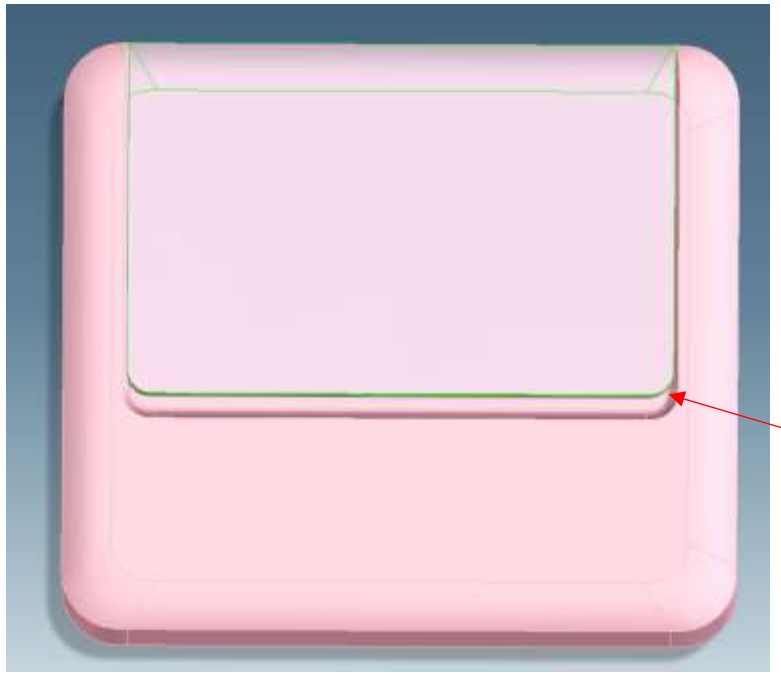
March 2nd, 2022

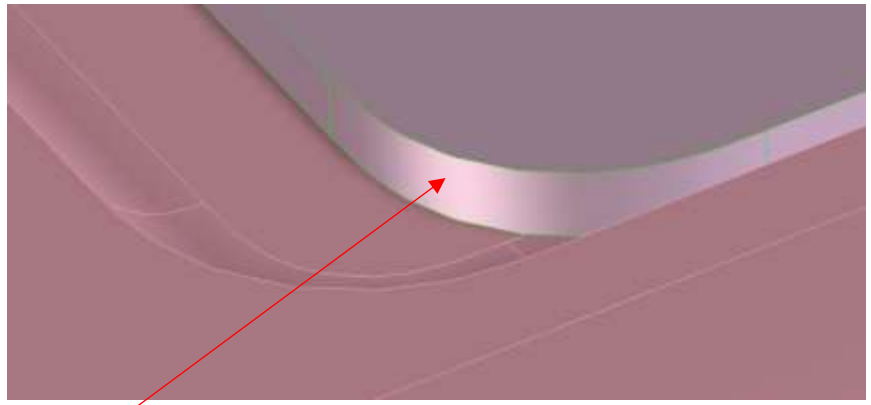
Creating Victoria ADF Input Tray

1) STAMPED out same depth as Sayan – from Victoria Tower BLOCK TOOL







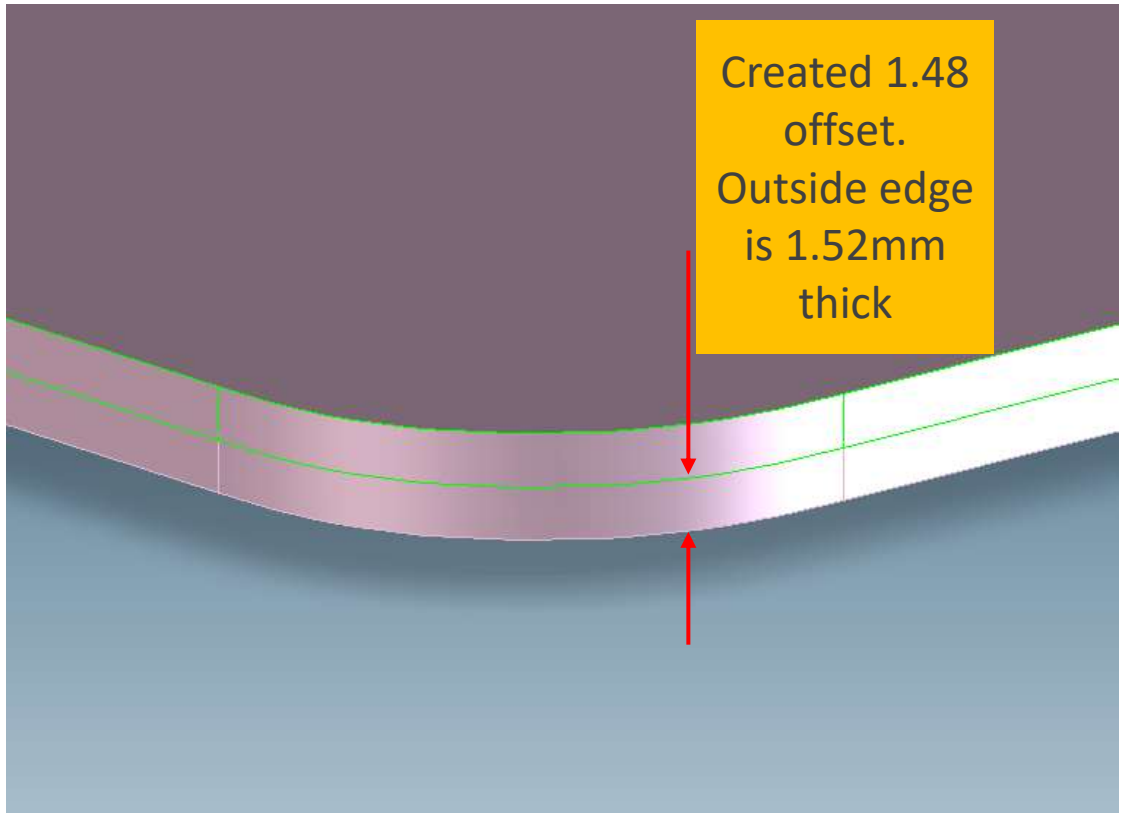


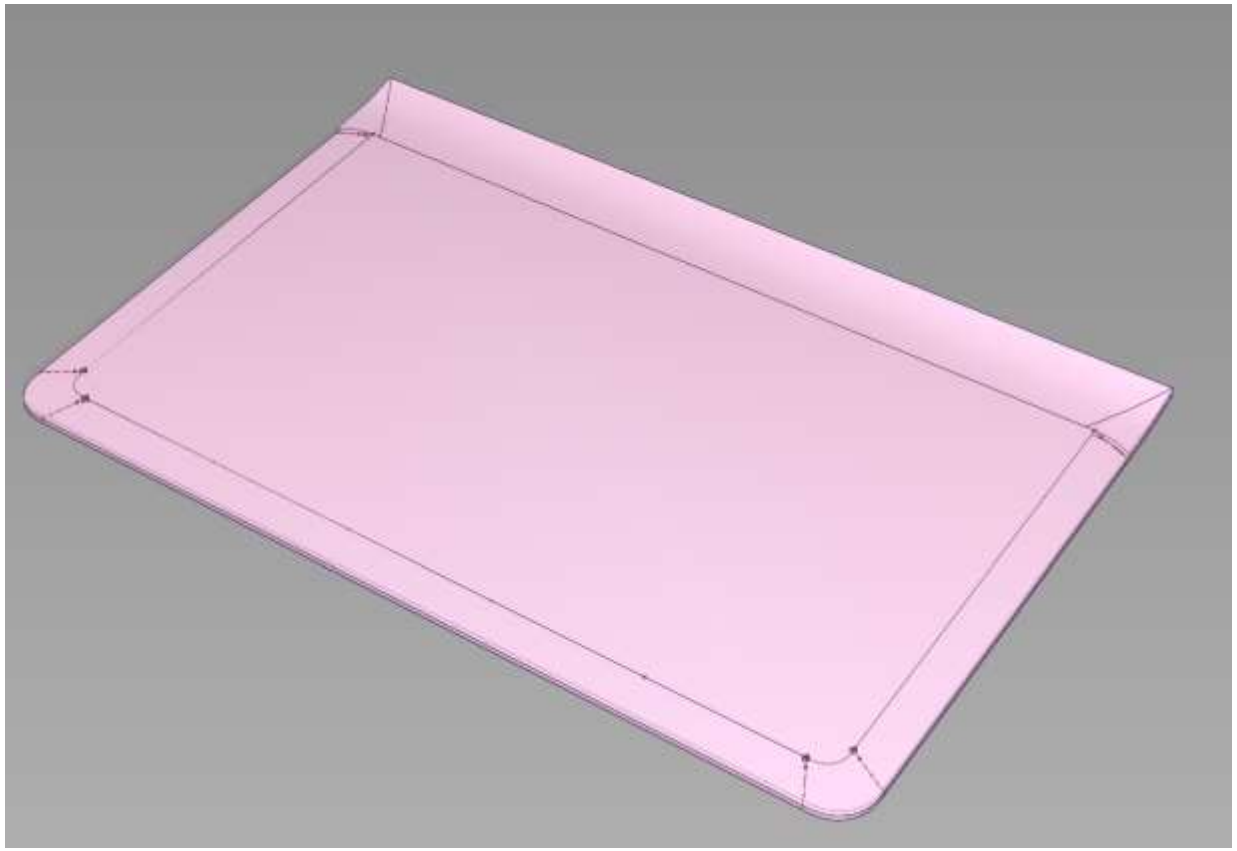
2) Added 12mm Curvature Continuous radius x2

ADF – Input Tray – CD1

March 2nd, 2022

Creating Victoria ADF Input Tray



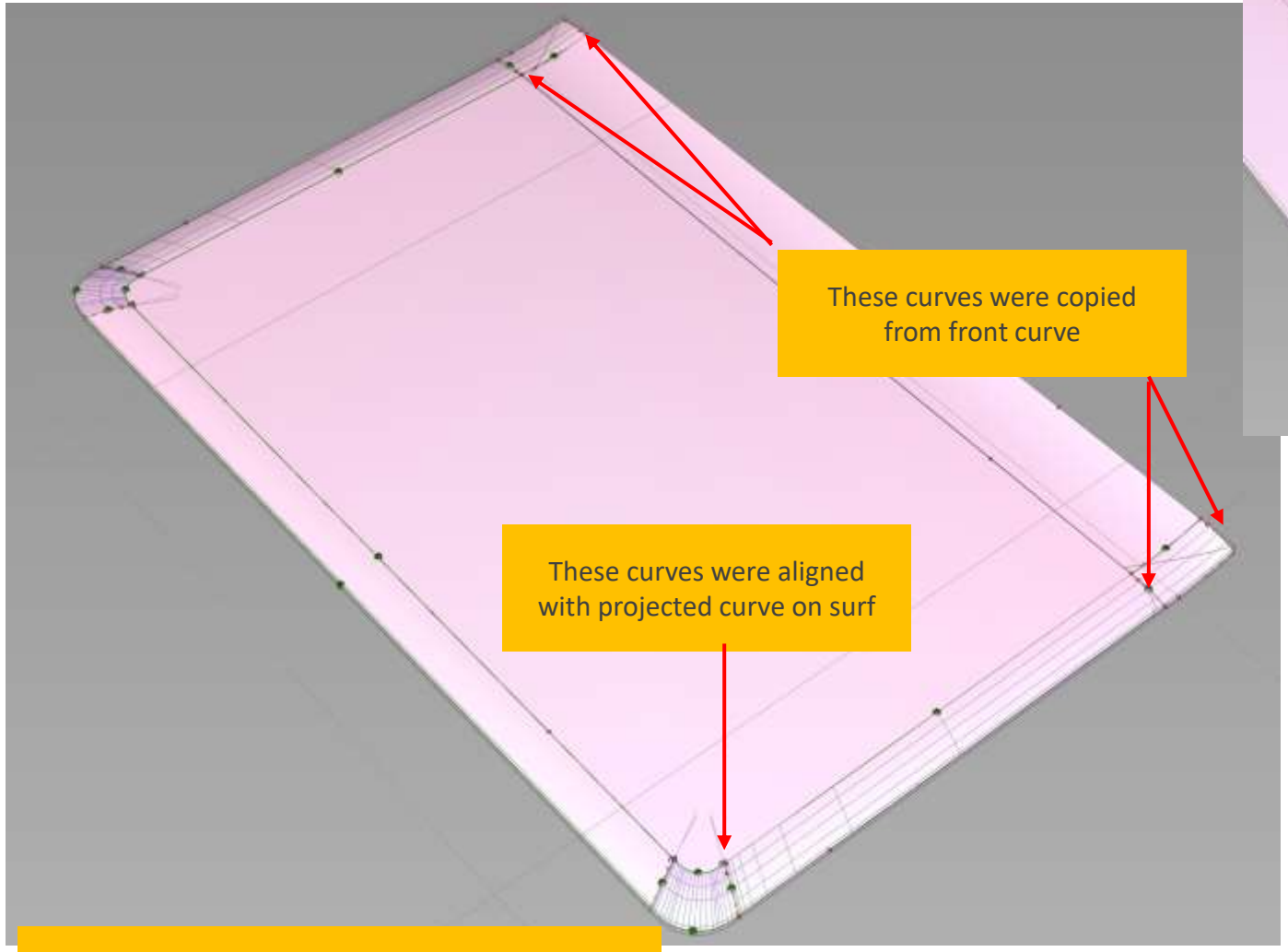


WIP creating pillow/low-profile radii on underside of tray
Tray same depth as Sayan ADF Input

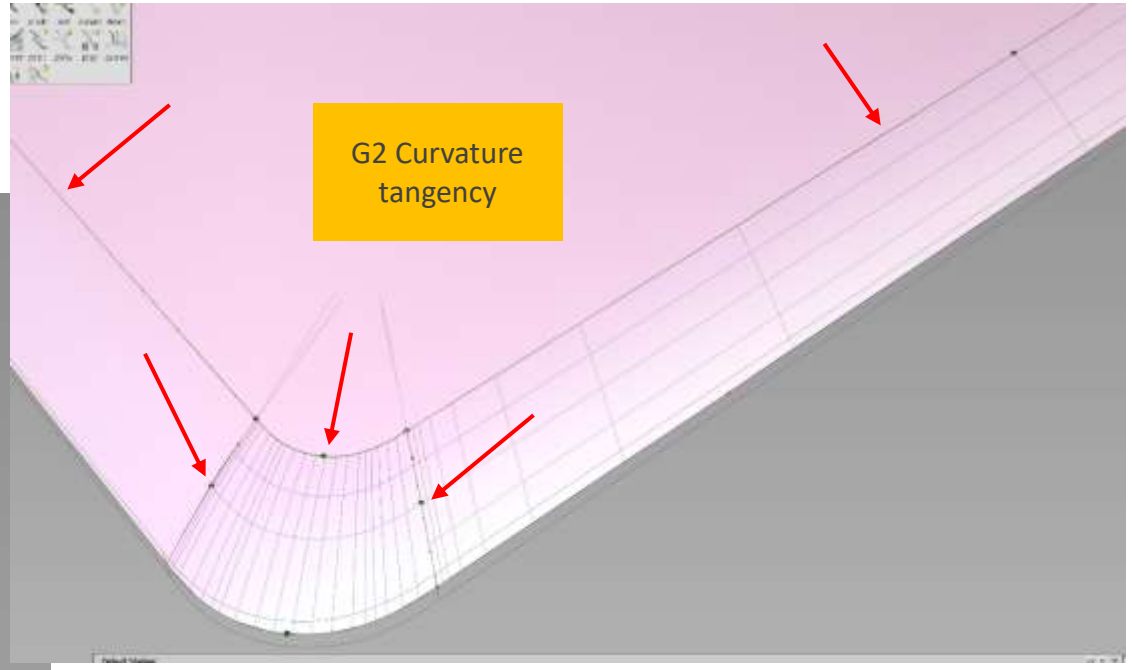
ADF – Input Tray – CD1

March 2nd, 2022

Creating Victoria ADF Input Tray



Best way to create this part was simple-as-possible
2 inside surfaces and 7 soft radius surfaces

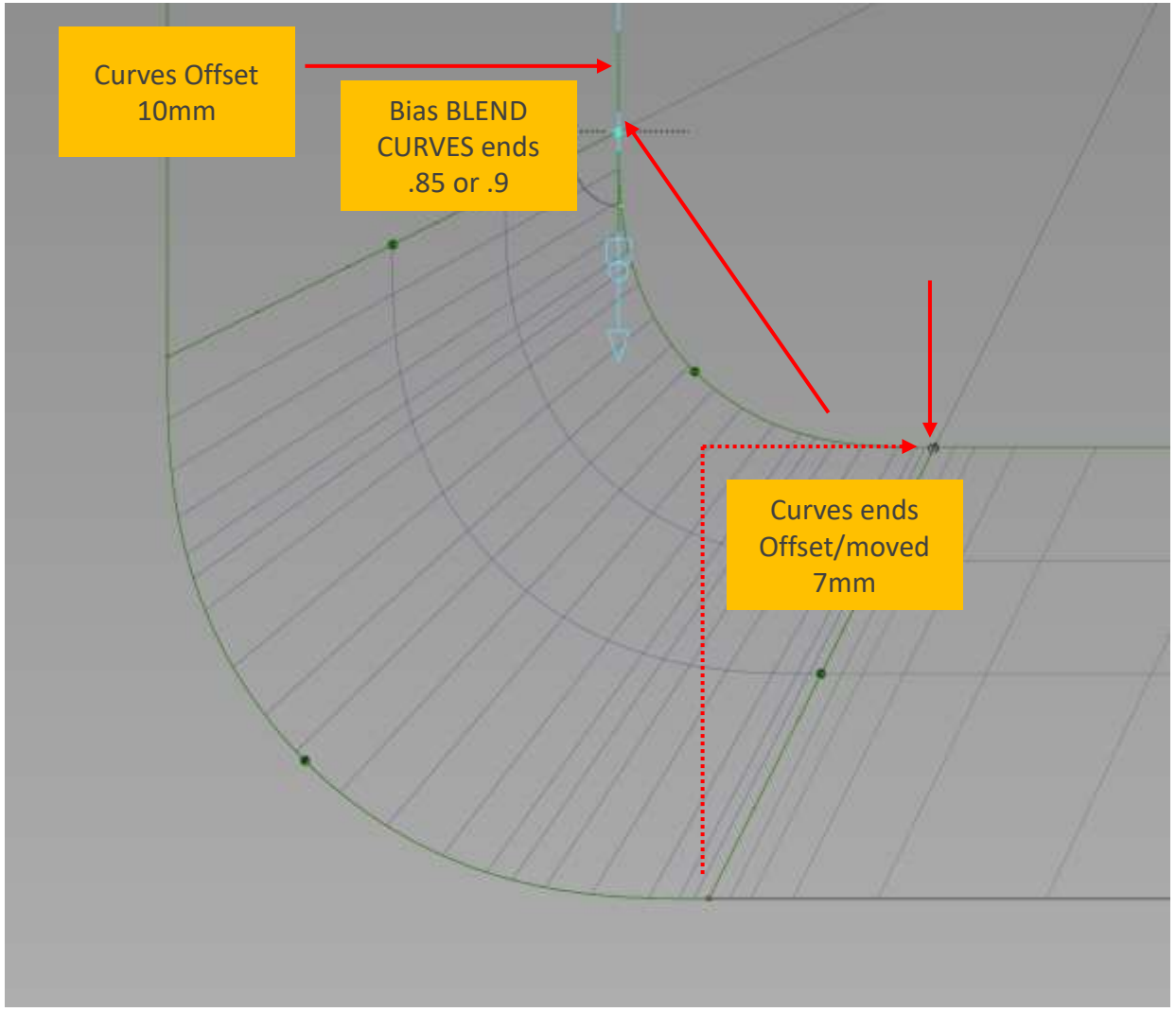


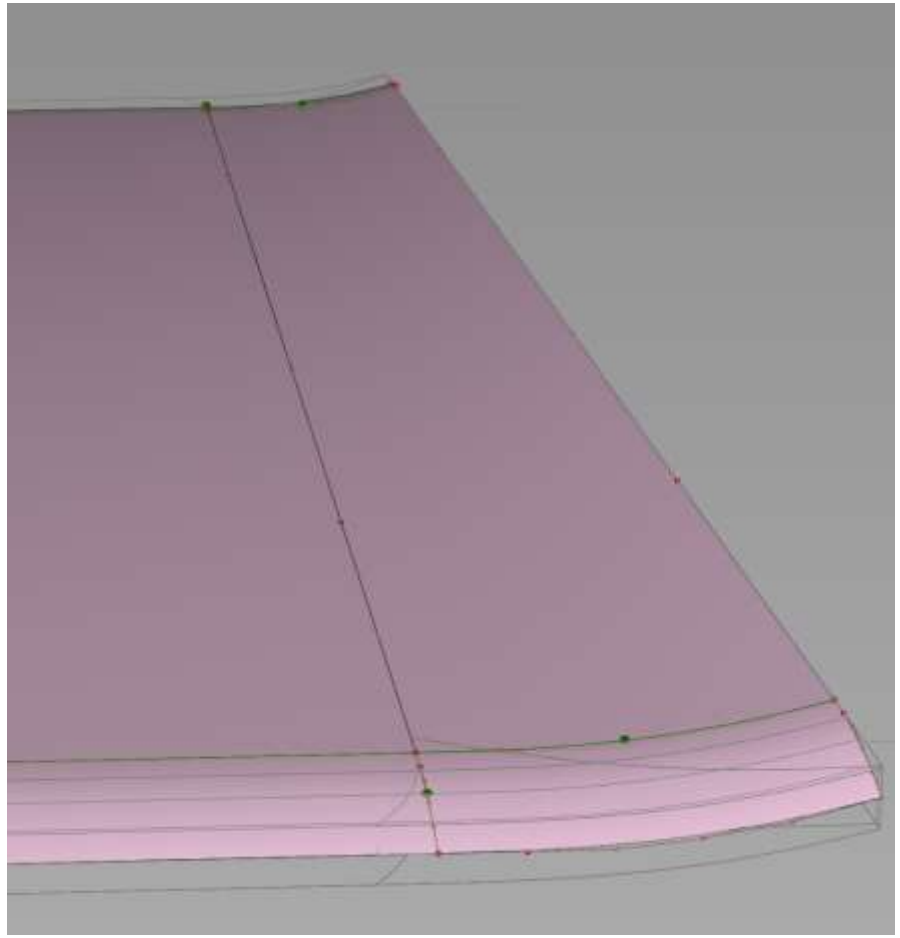
Alias file = ADF_Input_Victoria2.wire (Mar 3rd, 2022)

ADF – Input Tray – CD1

March 2nd, 2022

Creating Victoria ADF Input Tray

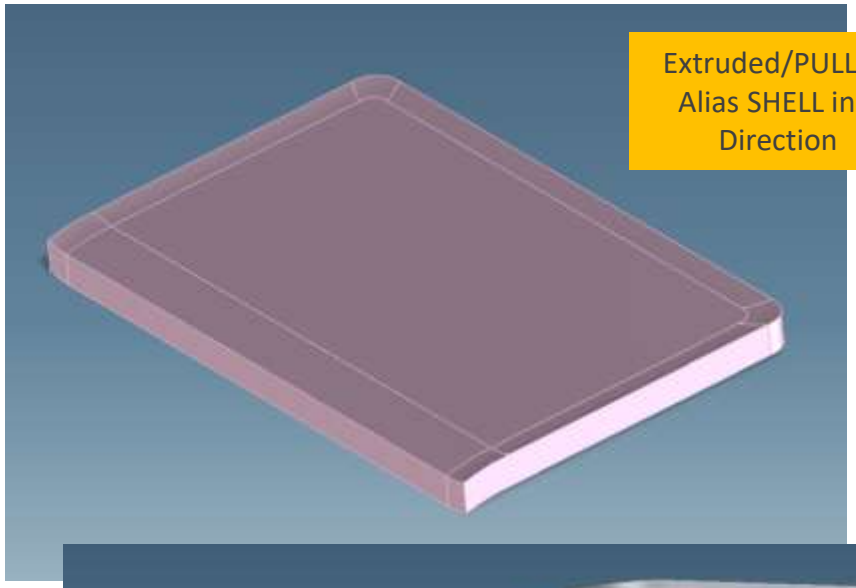


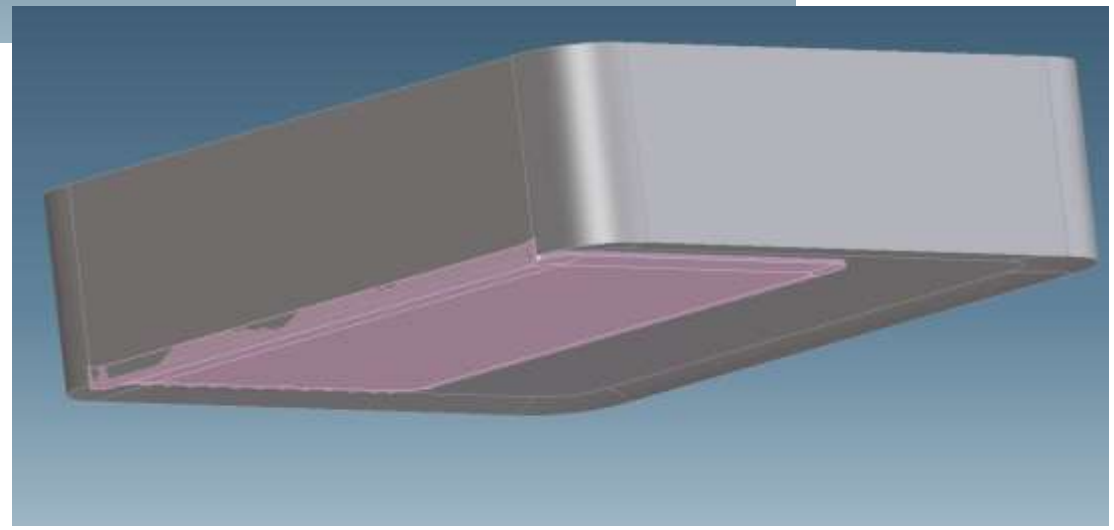


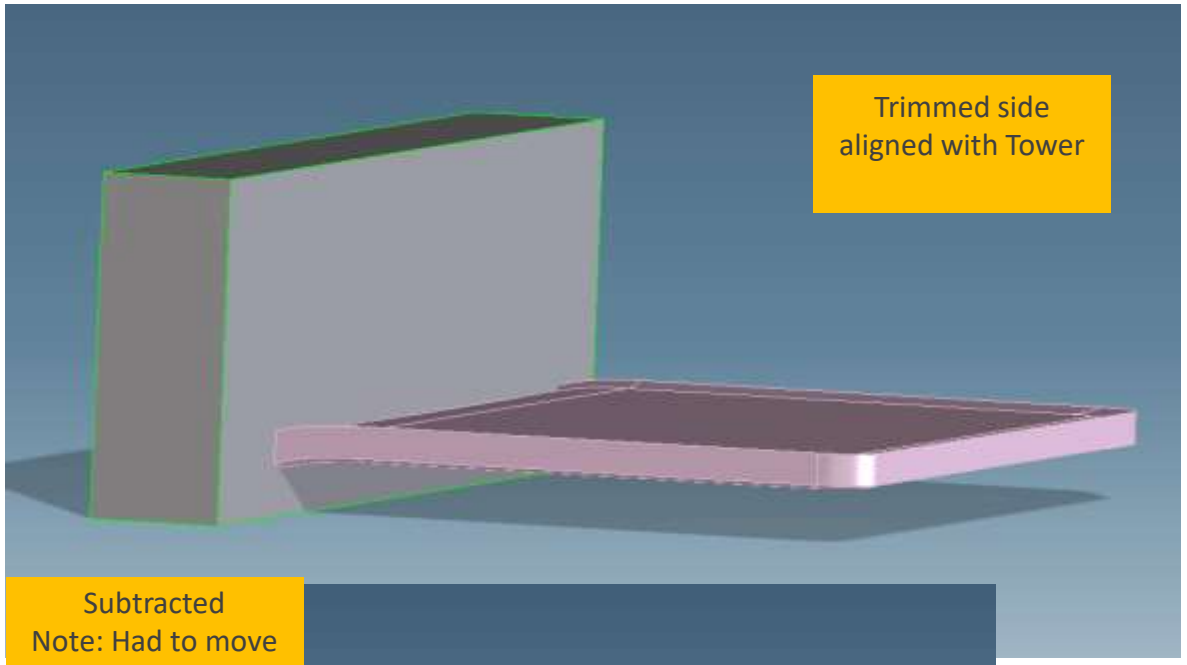
ADF – Input Tray – CD1

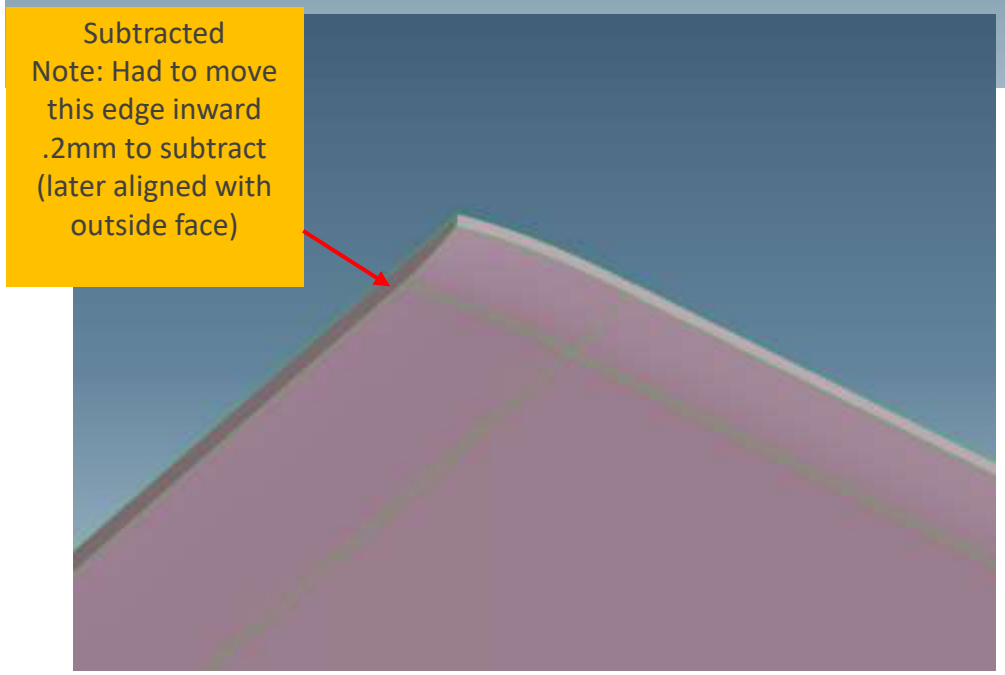
March 2nd, 2022

Creating Victoria ADF Input Tray





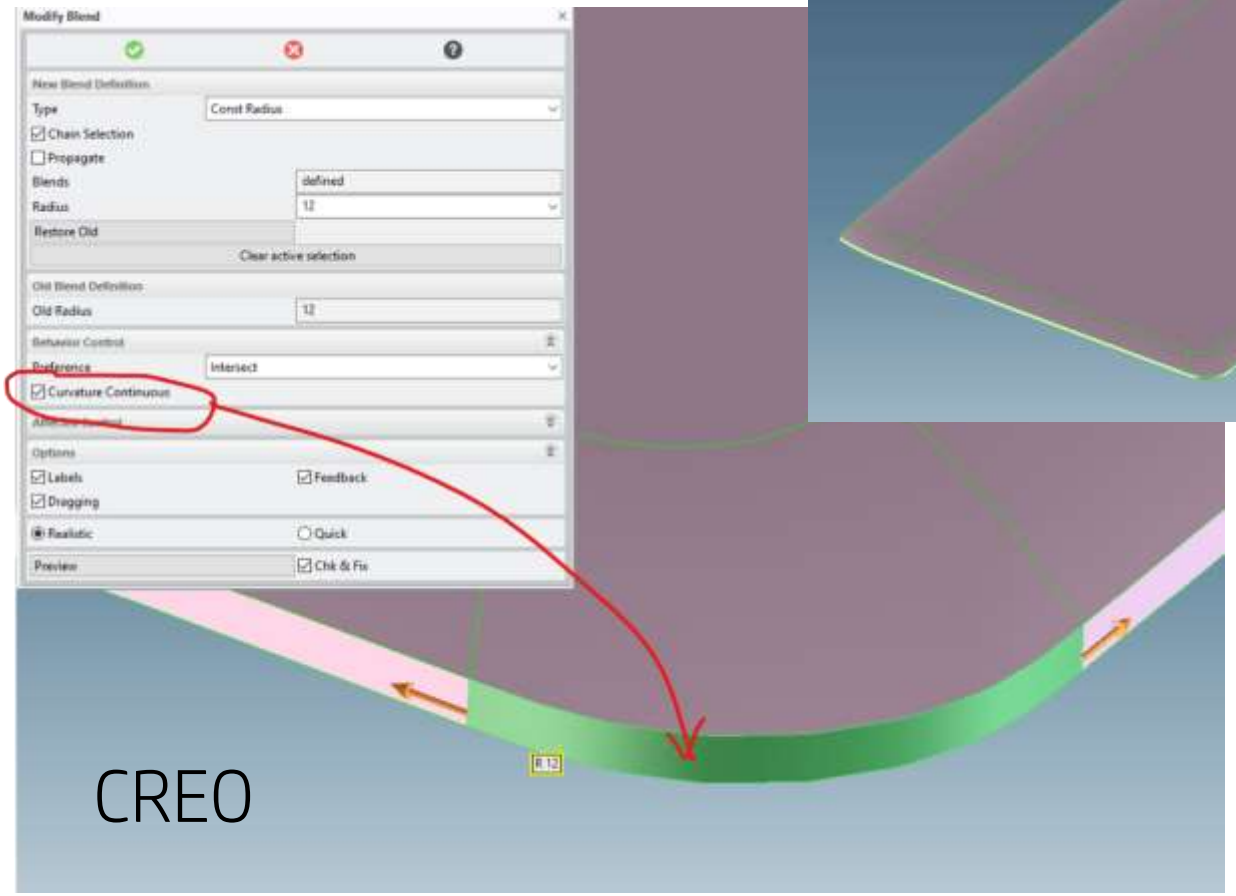


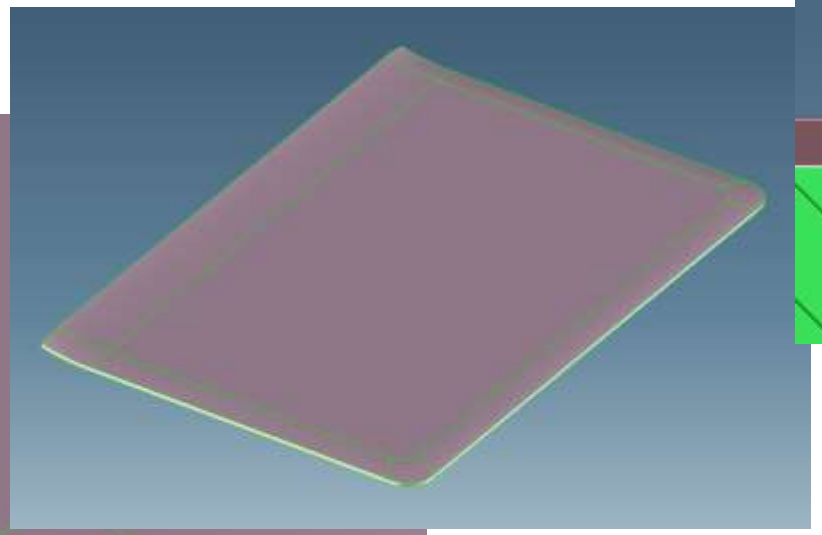


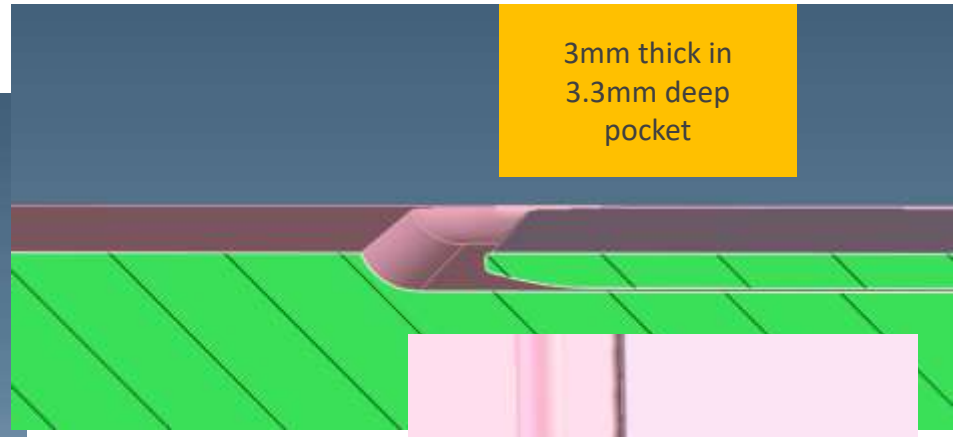
ADF – Input Tray – CD1

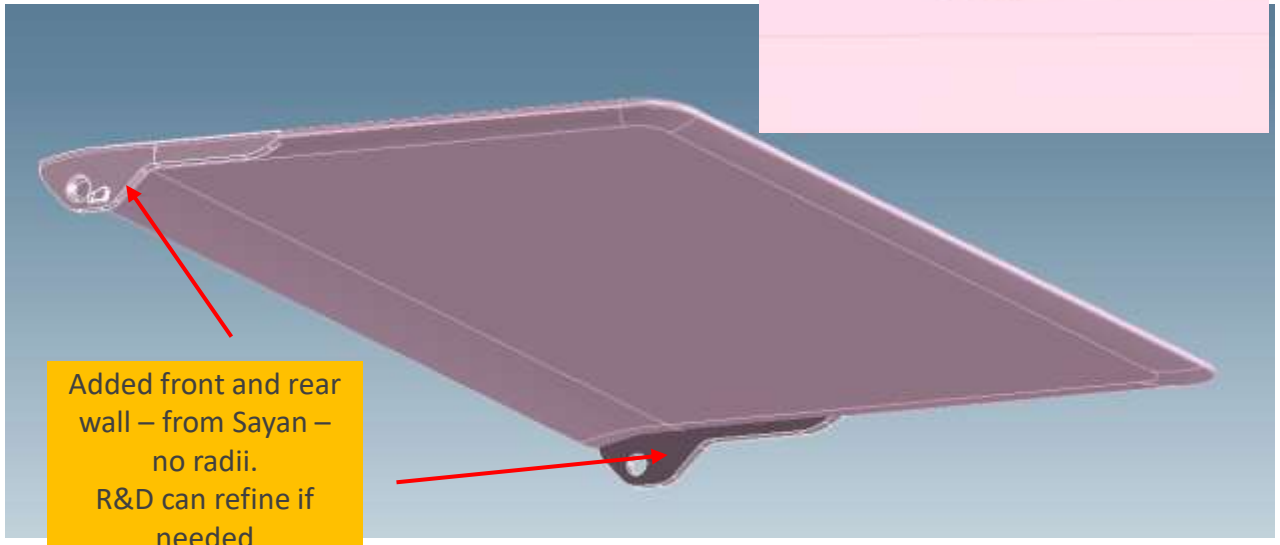
March 2nd, 2022

Creating Victoria ADF Input Tray









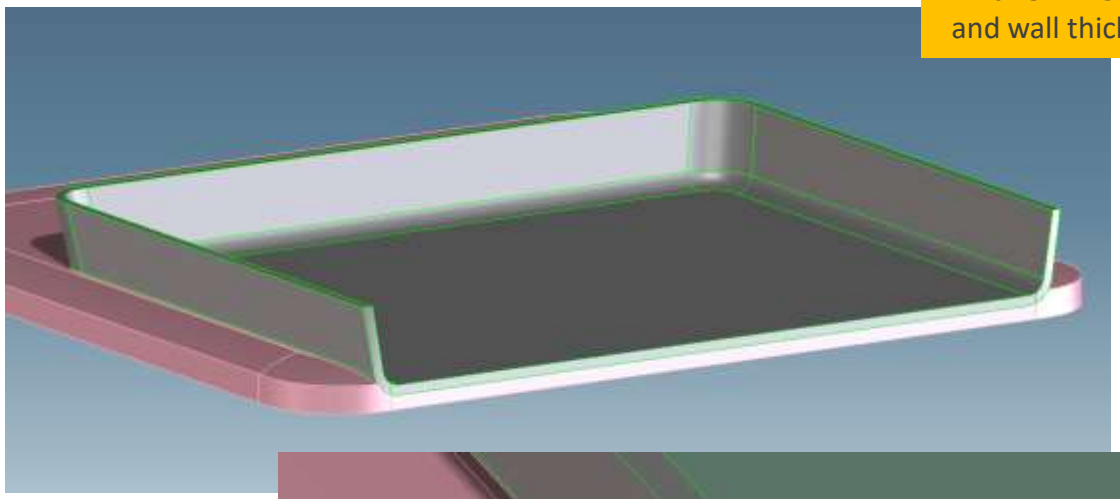
Recognize,
Modified to R12 CC

ADF – Input Tray – CD1

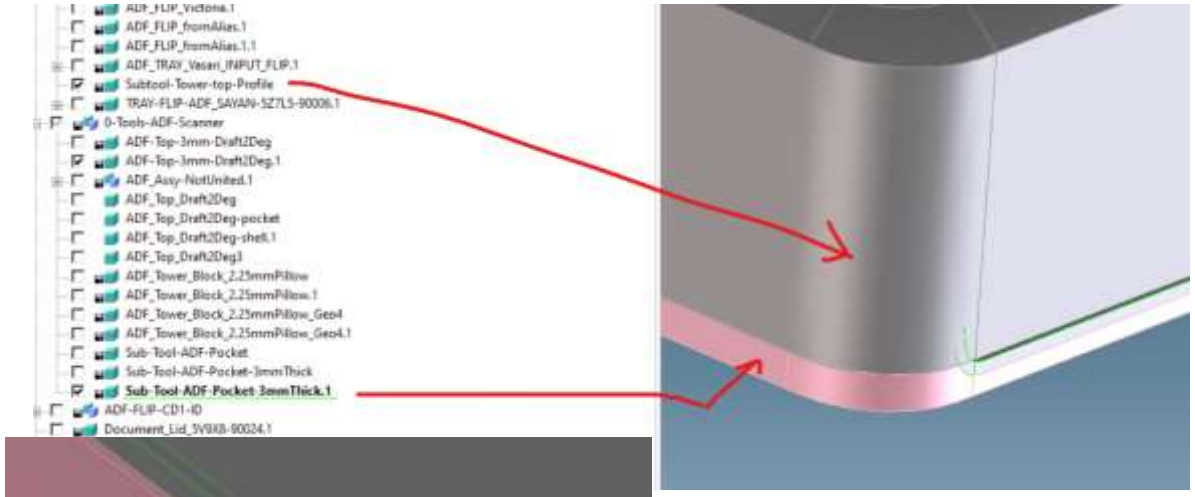
March 4th, 2022

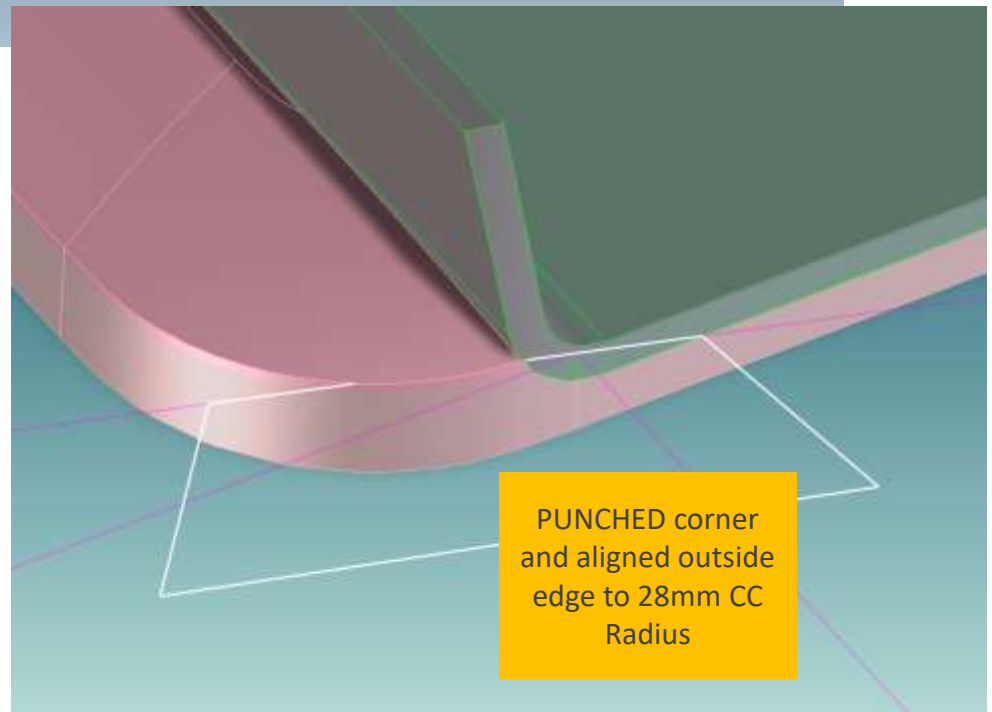
Creating Victoria ADF Input Tray

Updated version with 3mm SHELL and wall thickness

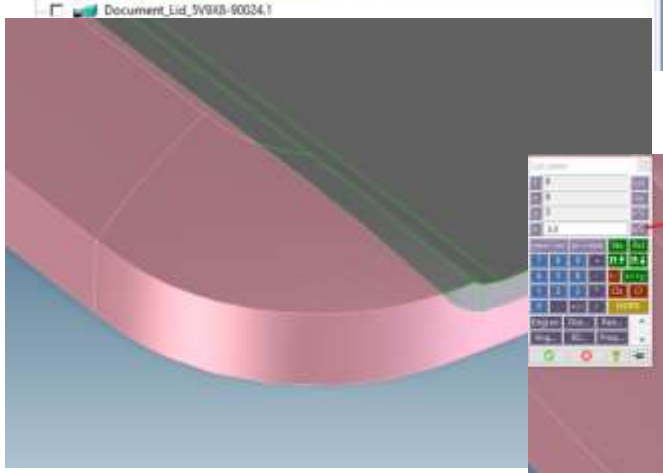


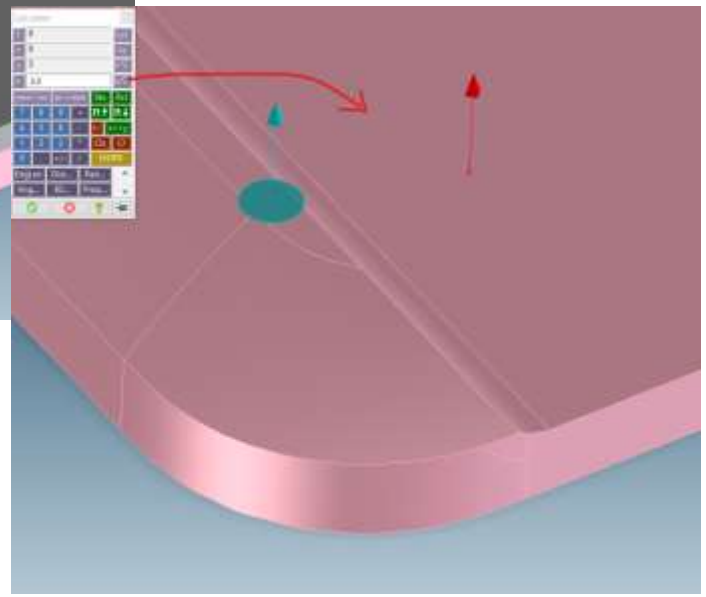
Trimmed top with subtraction tool as shown





PUNCHED corner and aligned outside edge to 28mm CC Radius





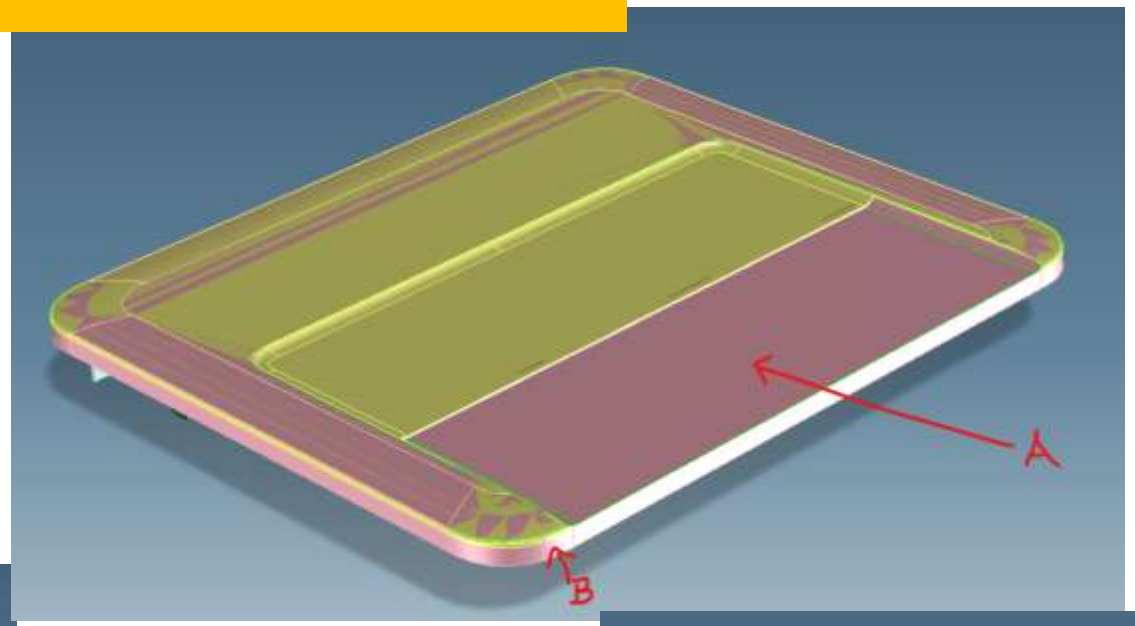
United parts
Body is 3mm thick and has 2 degrees draft

ADF – Input Tray – CD1

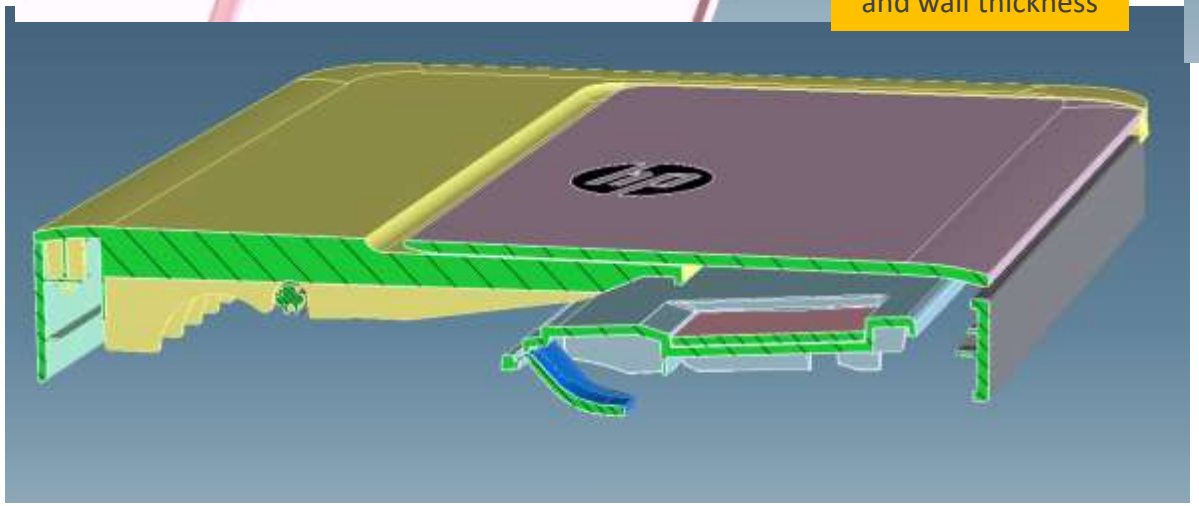
March 4th, 2022

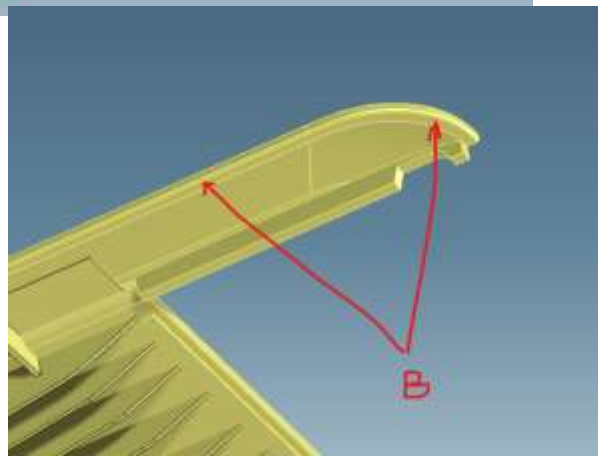
Creating Victoria ADF Input Tray

need to PUNCH and detail the top opening (A) and then ALIGN/MOVE/PUNCH/SUBTRACT the bottom edge so it is aligned with your current ADF top (I moved the bottom down so it would shell easier…)



Updated version with 3mm SHELL and wall thickness

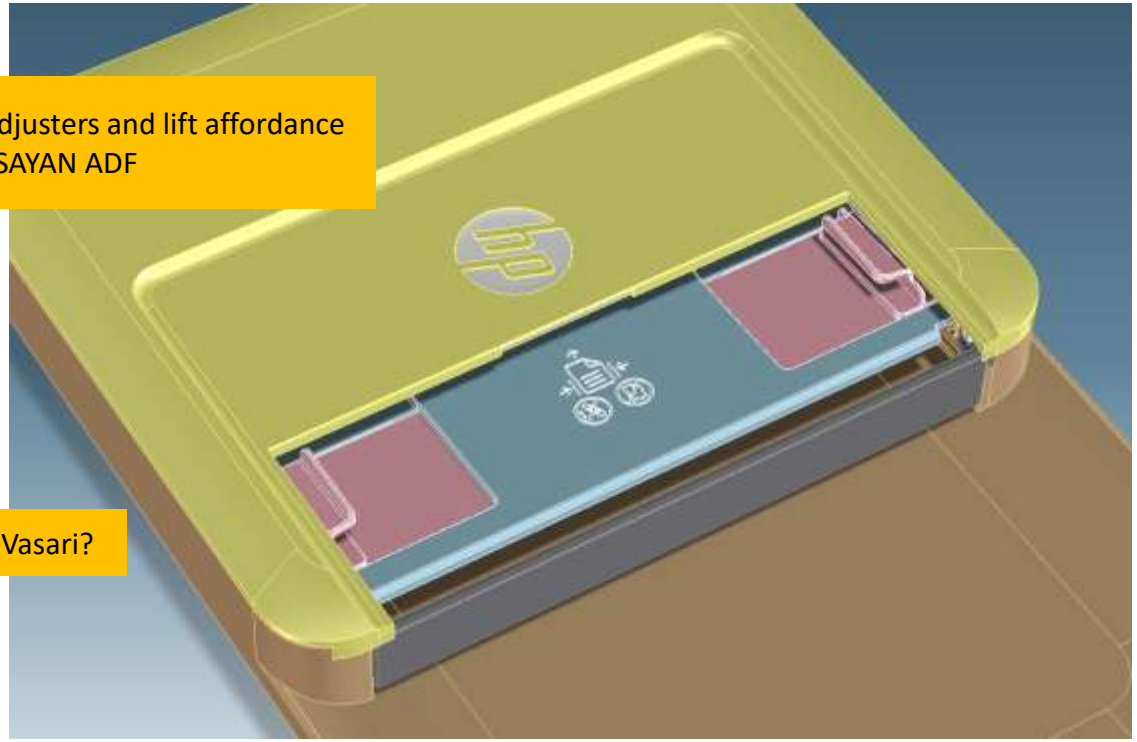




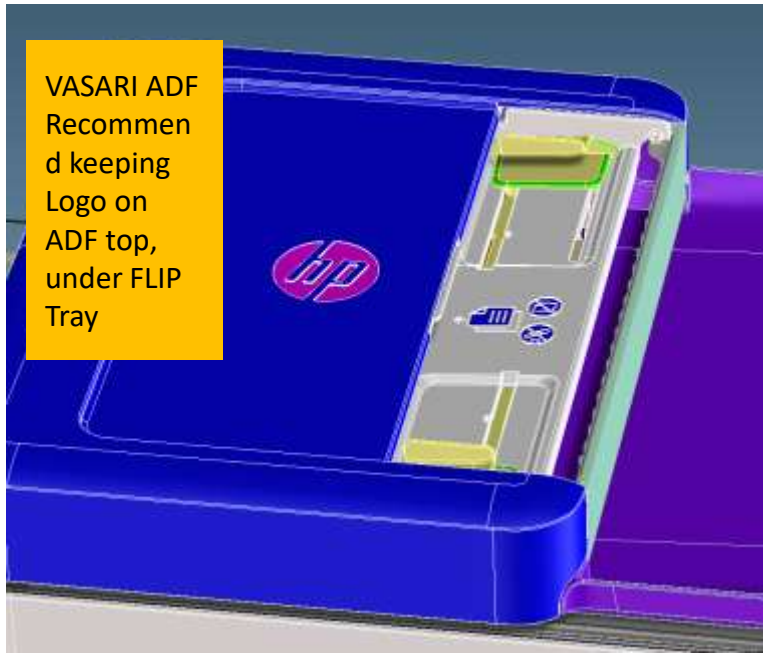
ADF – CD1 integration

March 5th, 2022

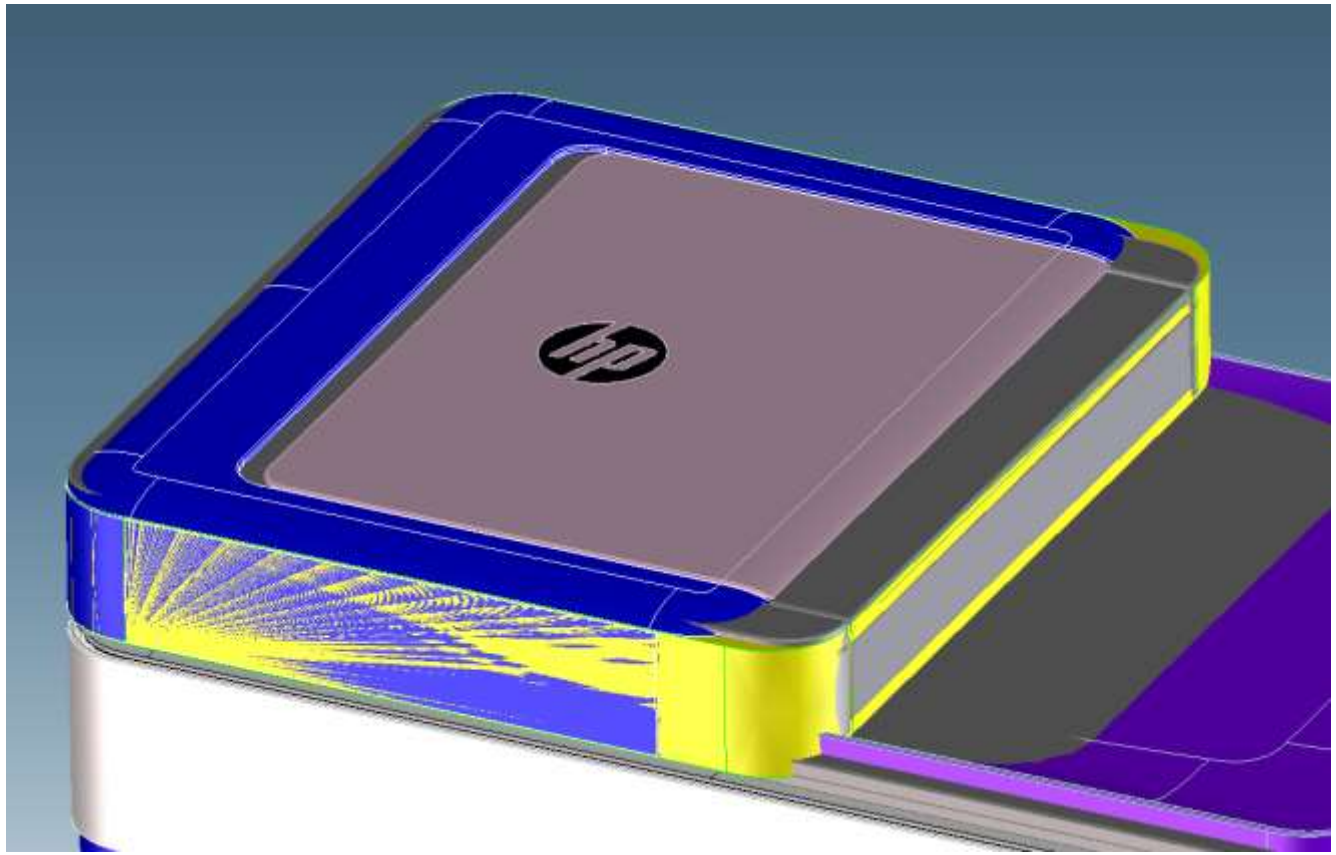
WIP – Victoria adjusters and lift affordance leveraged from SAYAN ADF



Do we want molded logo like Vasari?

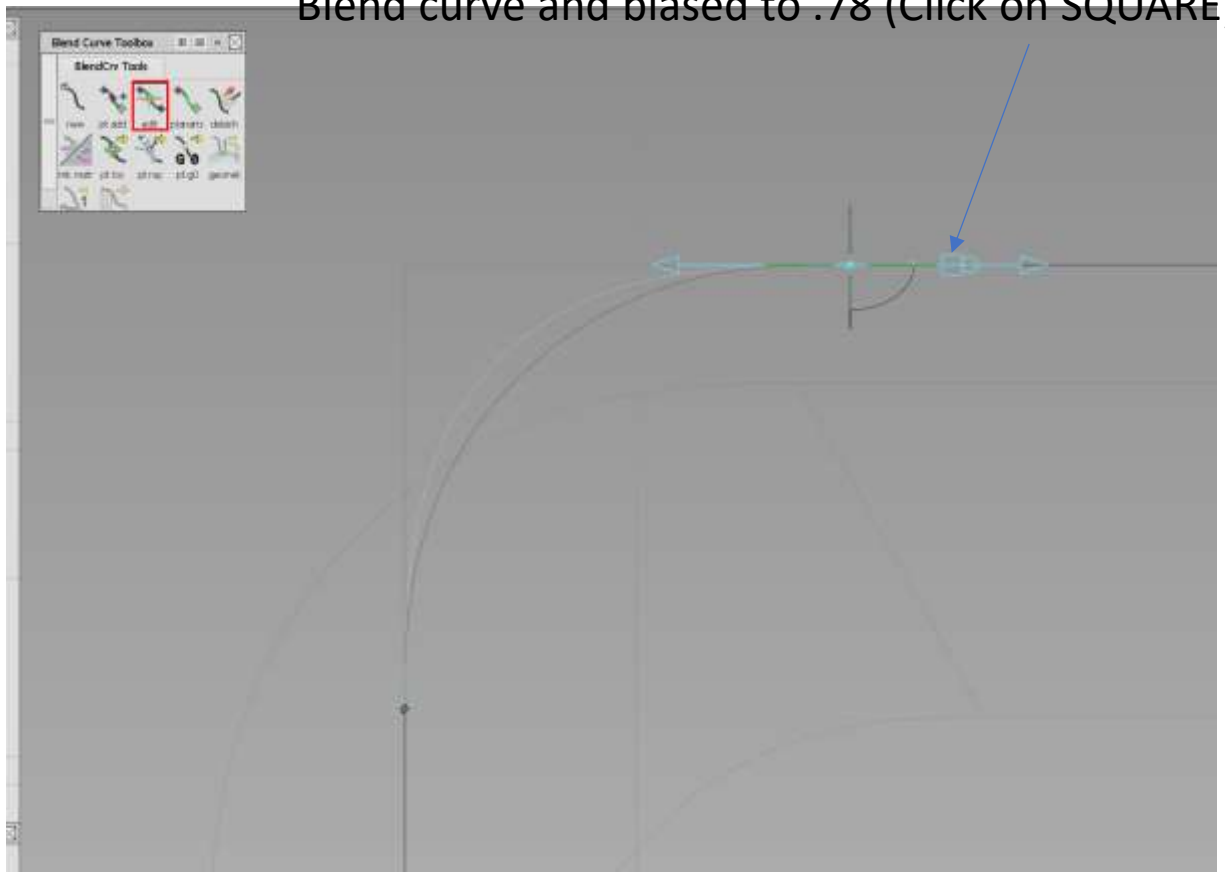


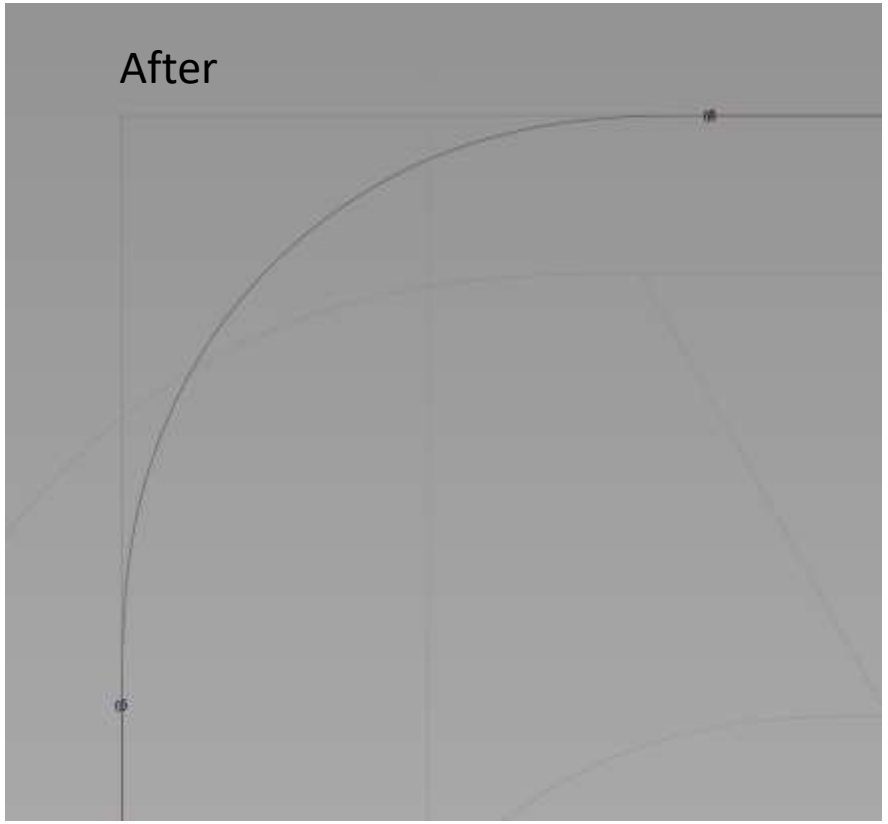
ADF – Pre CD1



For ADF match sides and CC 28 radius
Is longer to fit Prominade 3
Will try 3mm pillow first which is slightly less than Vasari PLUS.

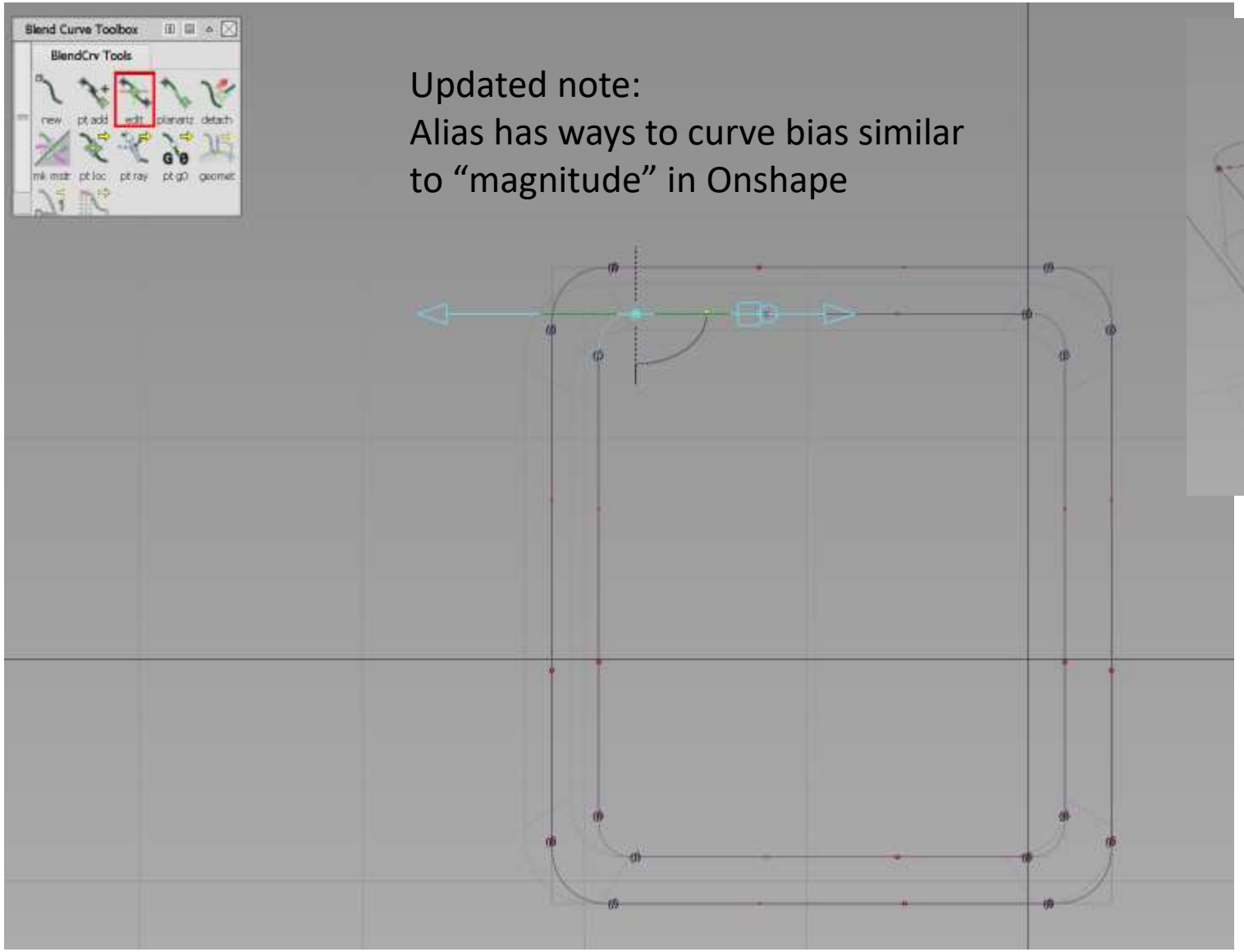
In Alias matched straight curves. Used Blend Curve tool then EDIT Blend curve and biased to .78 (Click on SQUARE)



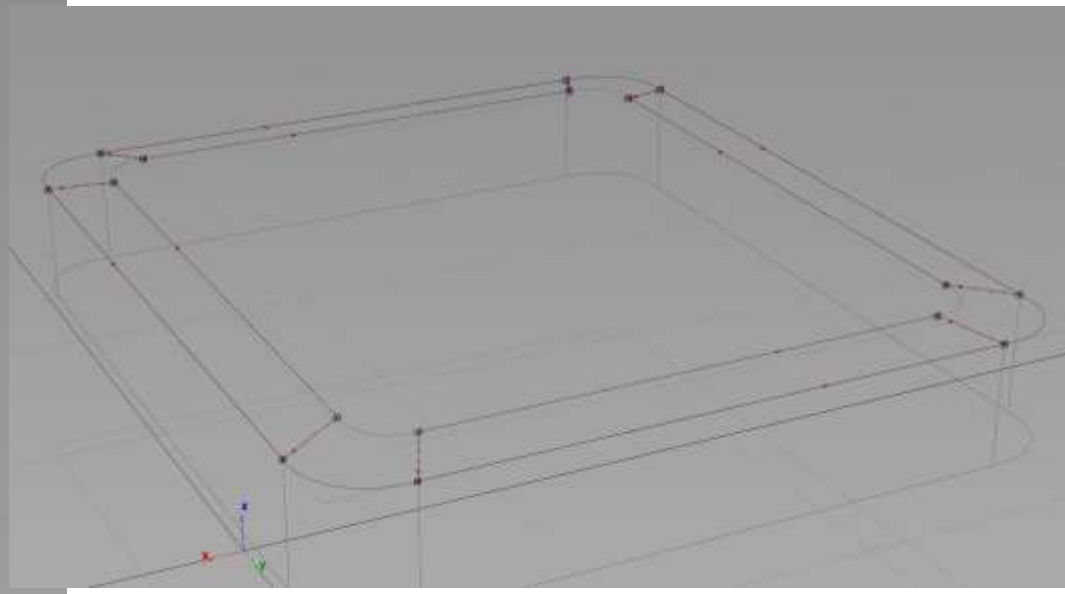


File ADF_Tower1a.wire

Offset inner straight lines 21mm x4. Blend Curves and Edit Blend Curves at .78 x8…

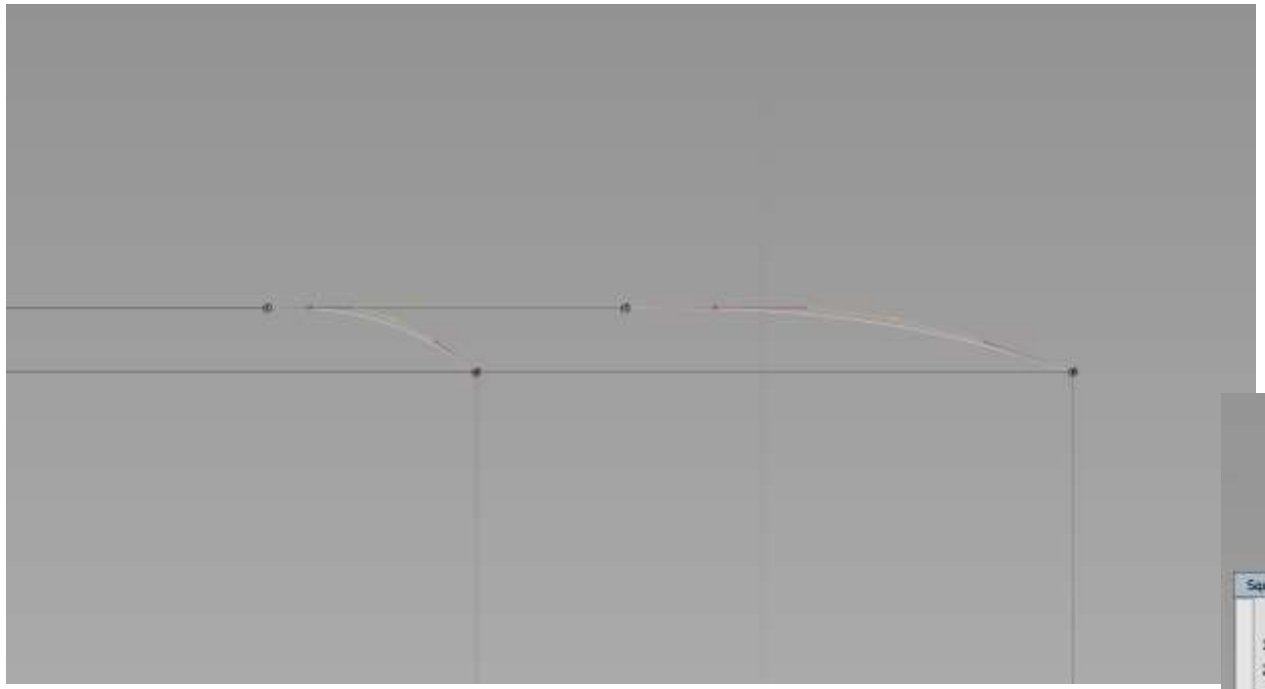


Updated note:
Alias has ways to curve bias similar to “magnitude” in Onshape

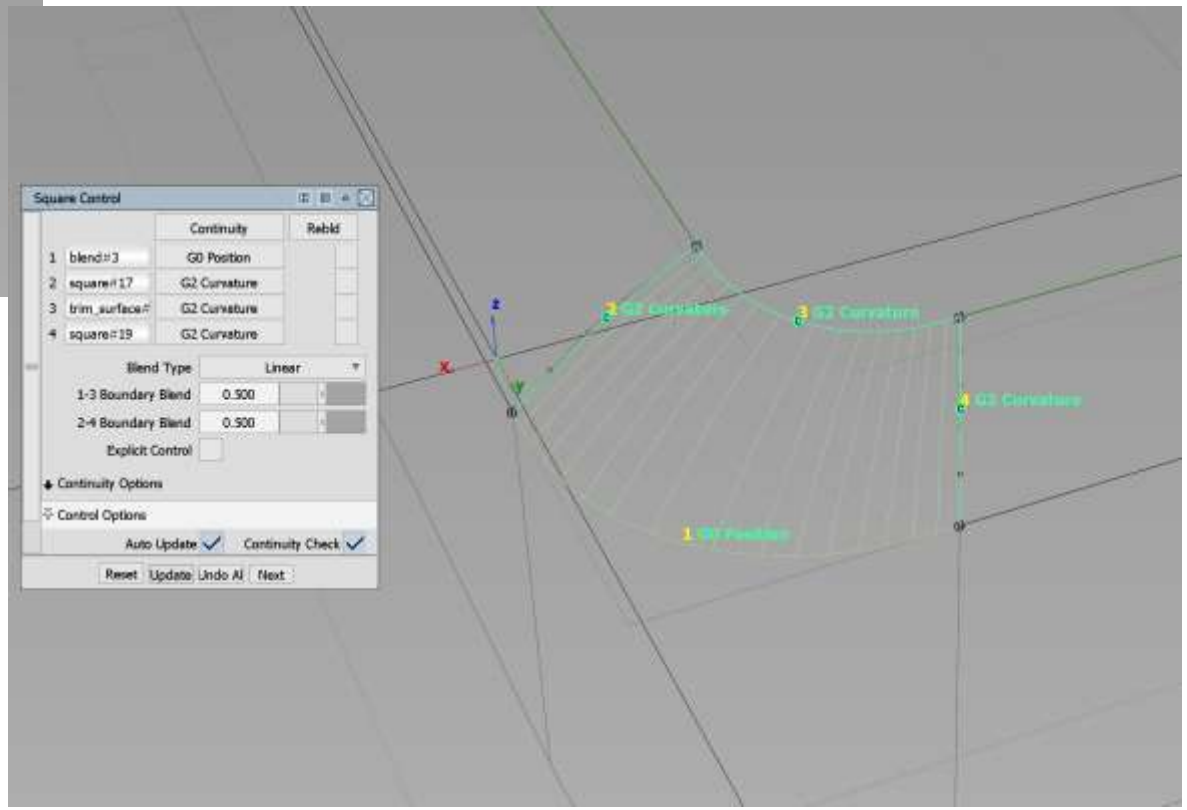


Started with Degree 5 straight curves with G0 position
…3mm higher in middle…

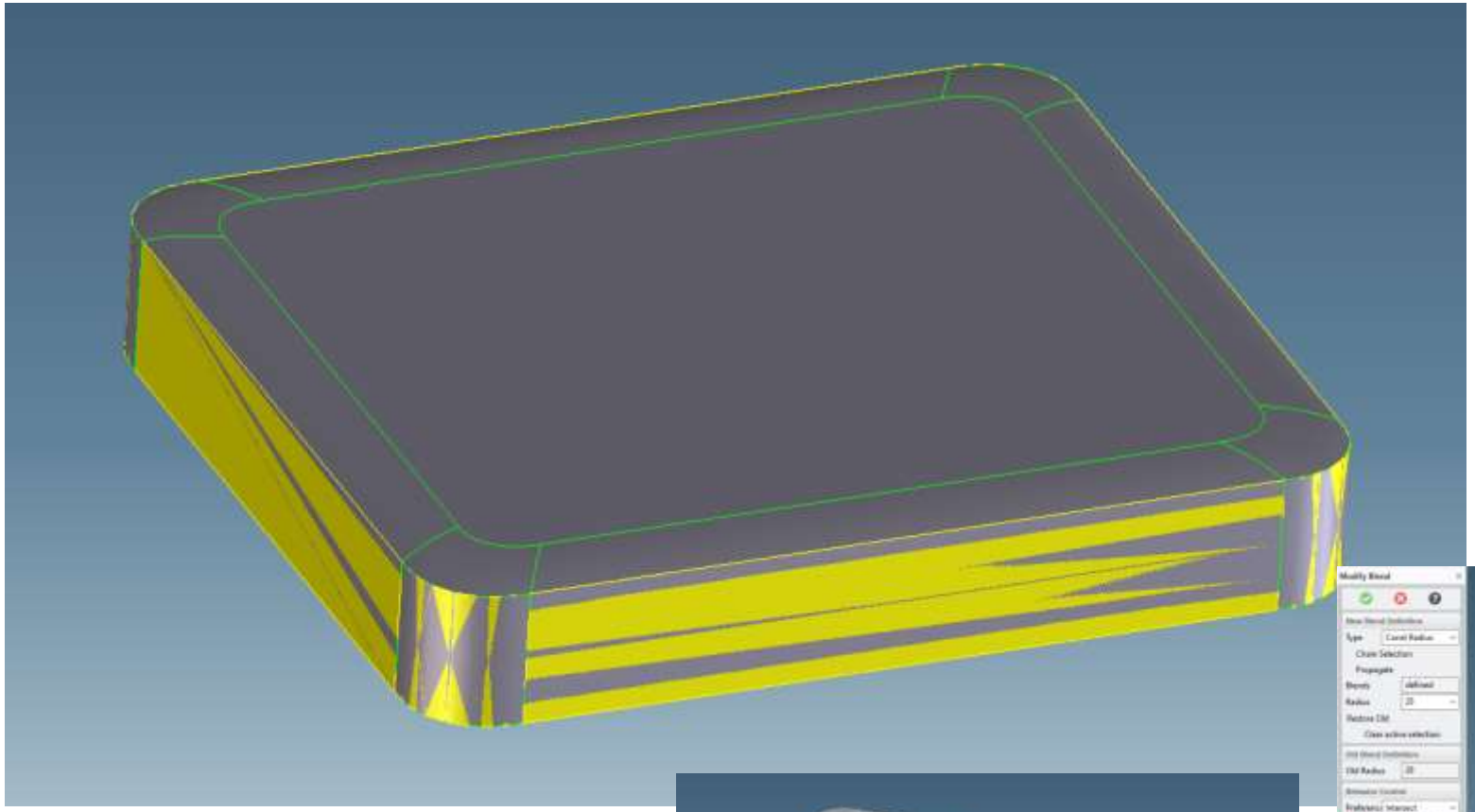
Snapped 3 inset CVs to align with top curve, then moved last inset CV, then edited 3rd inset CV as shown below.



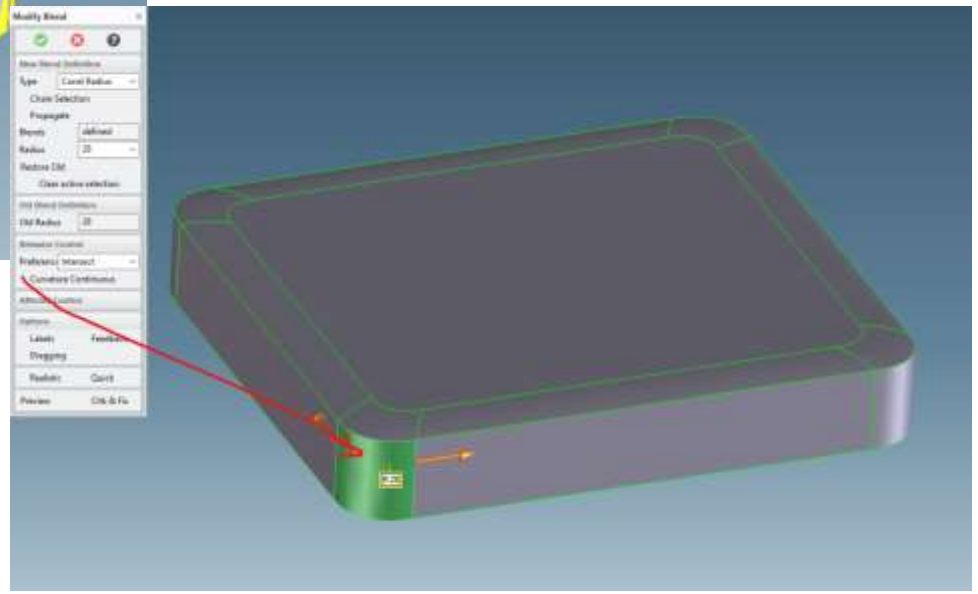
Curvature squares



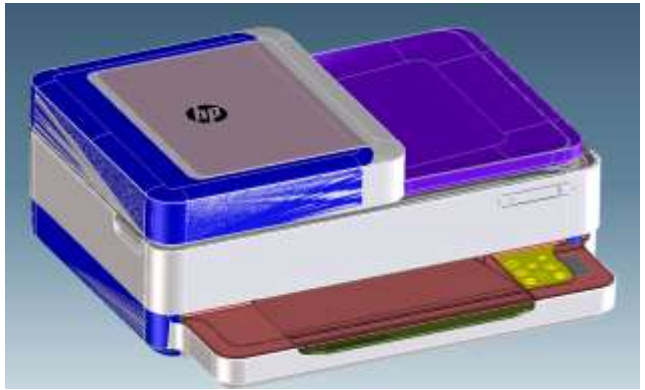
Imported 3mm pillow top to CREO. PULLED to thicken into solid.

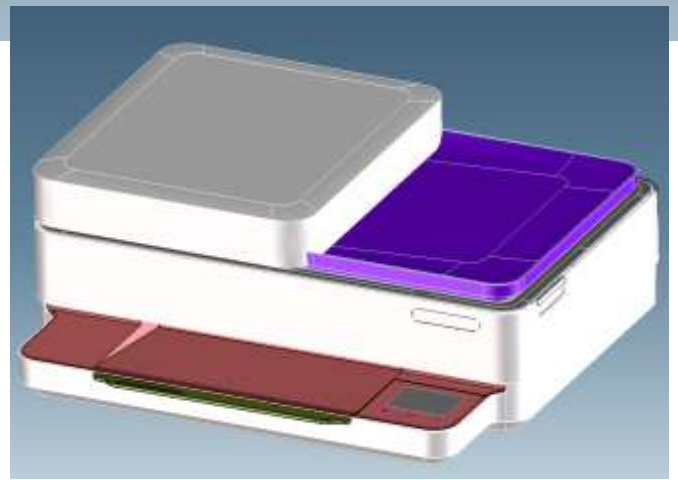


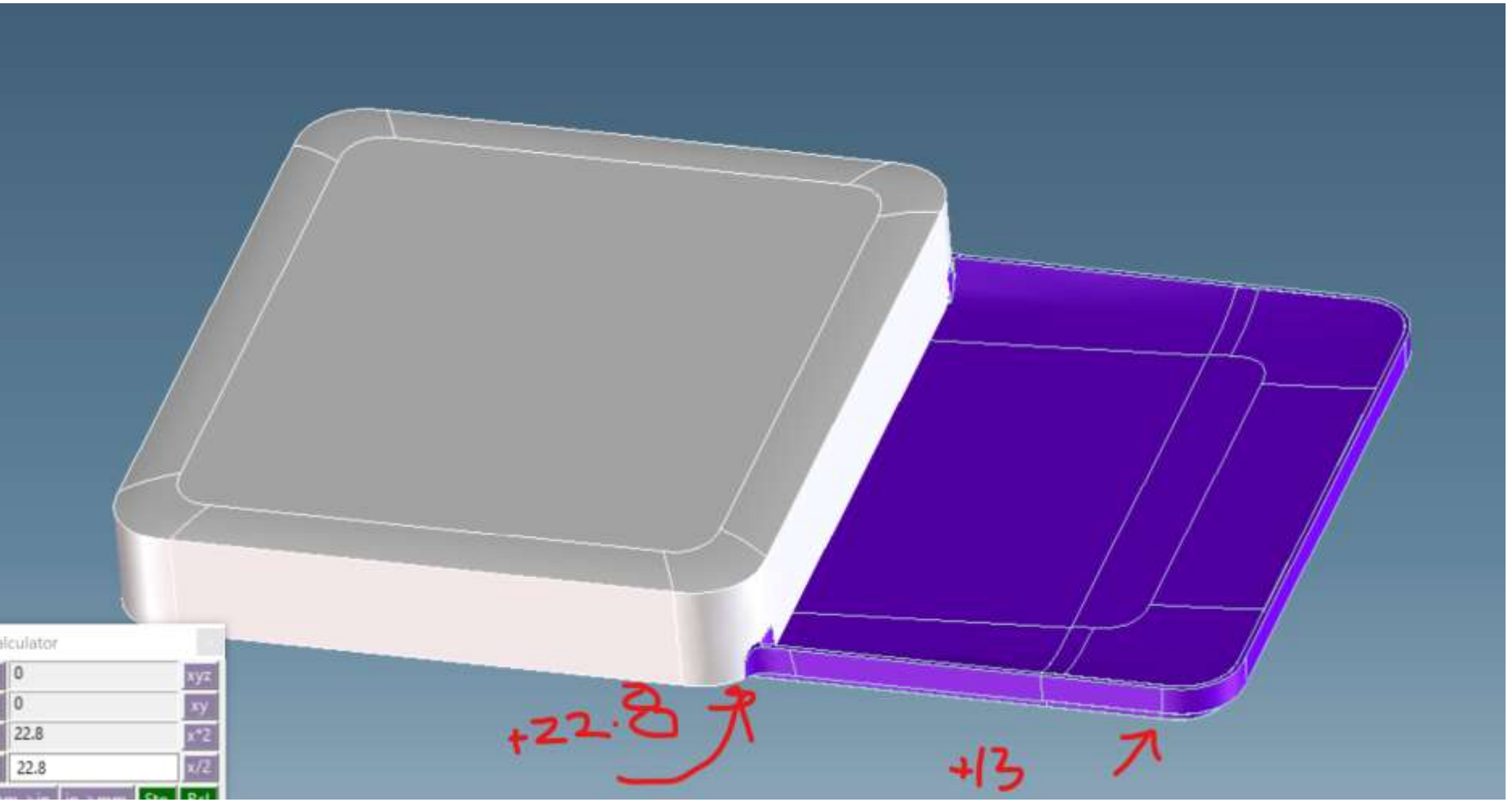
Modify radii and make sure they are CC 28mm x 4

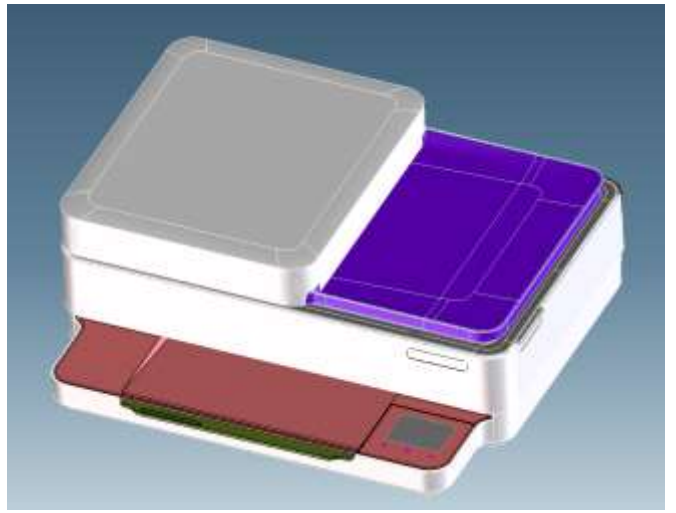


Many faces are in same position as Vasari PLUS

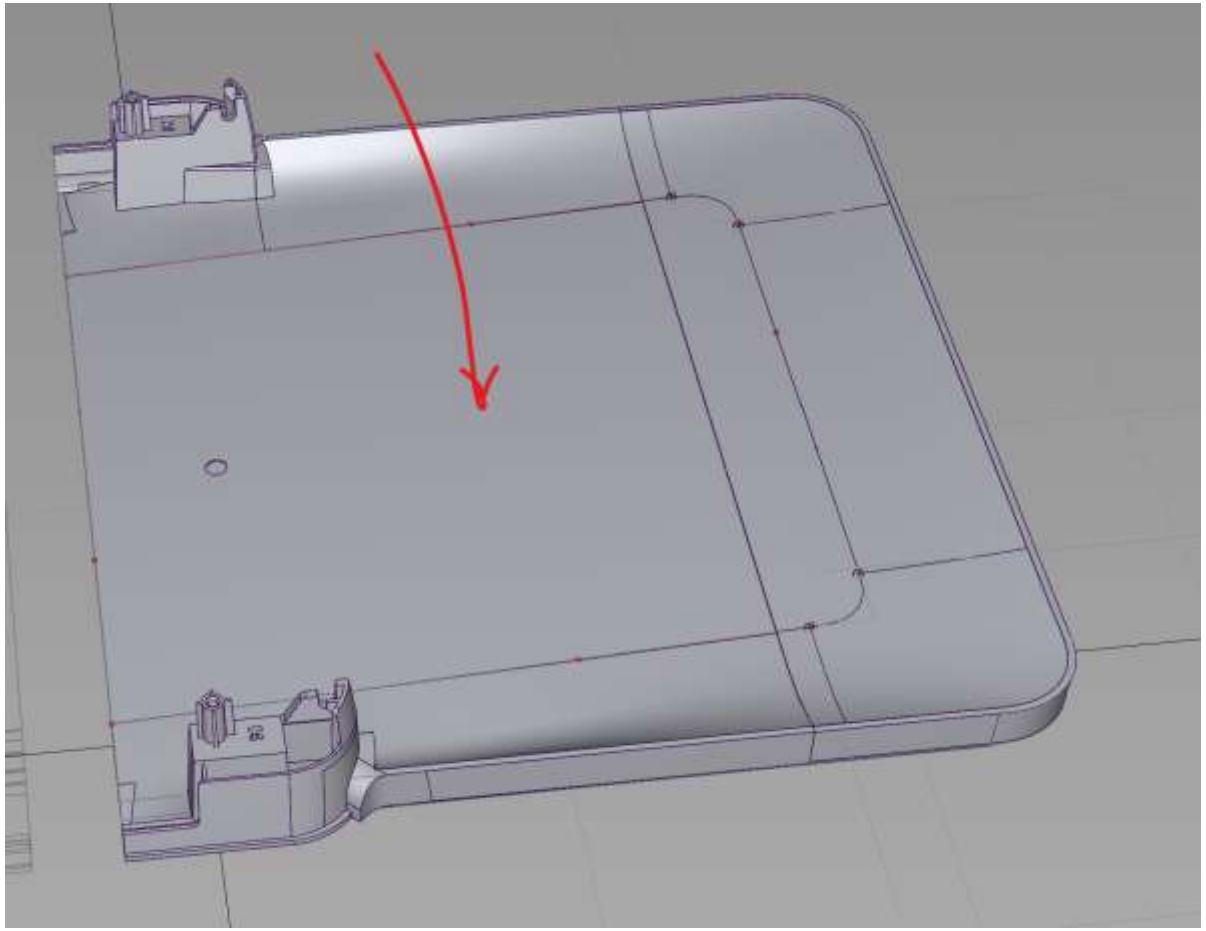






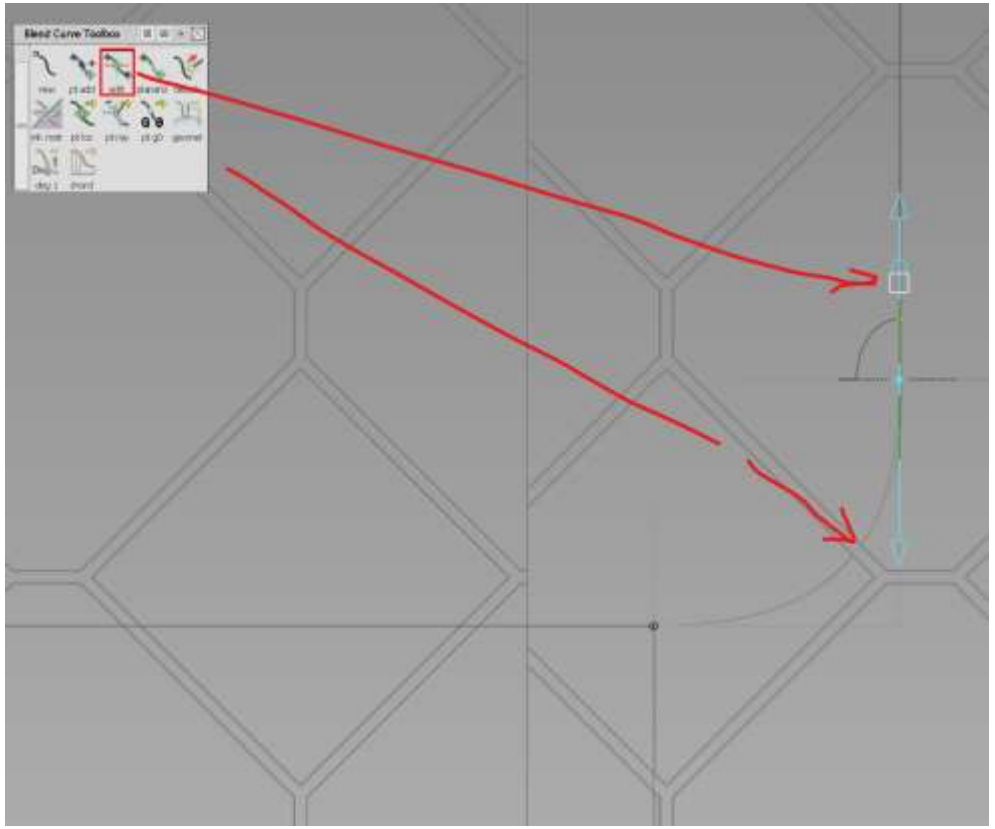


Made underlay from Vasari ADF CAD
Moved attachment taper 22.8 because Prominade 3 is that much farther to right.
Right side is 13mm wider.

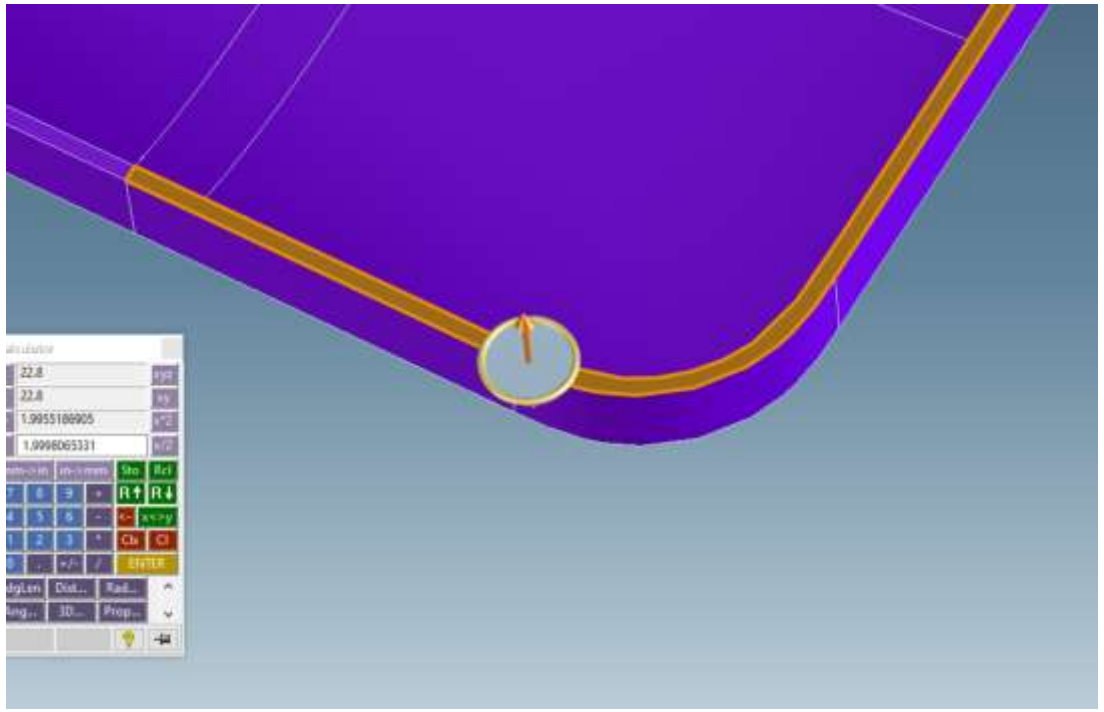


Creating subtool in Alias.

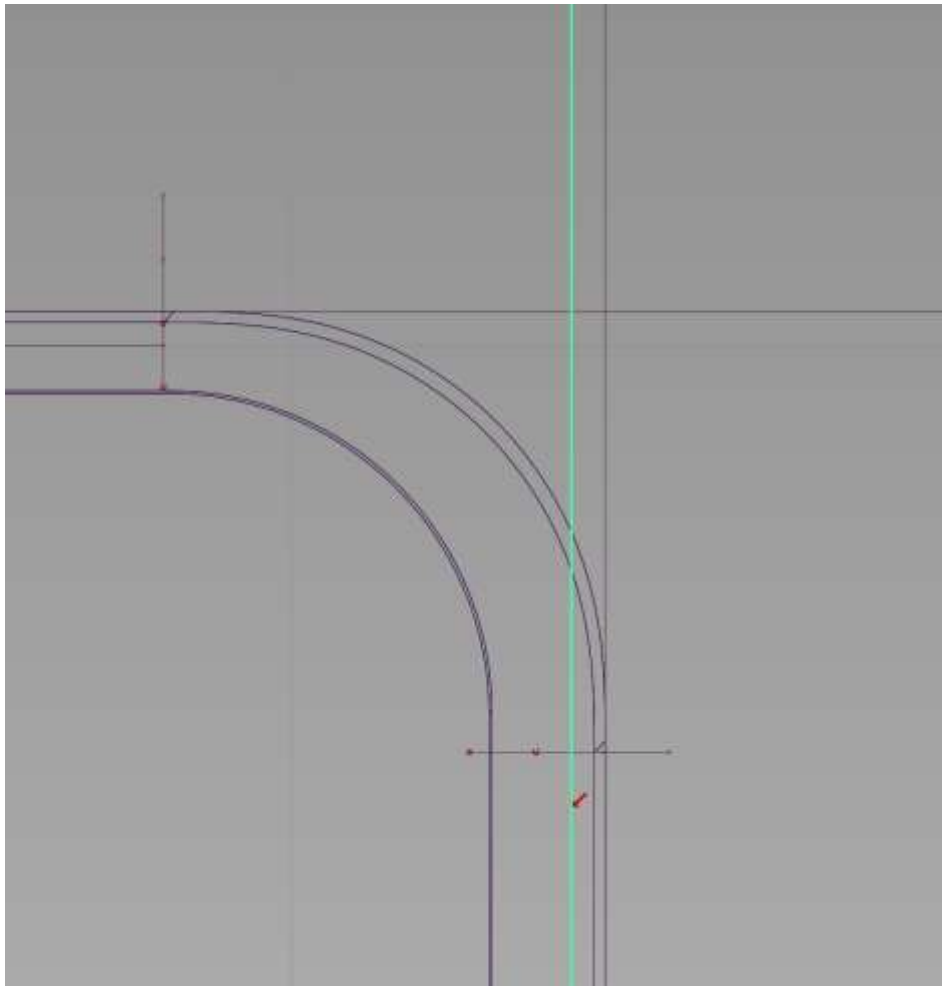
Used Blend Curves and EDIT Biased .85 on each G2 side…
This surface at angle, slightly diff but close to Vasari PLUS



Dish area is offset ~2mm on Vasari PLUS

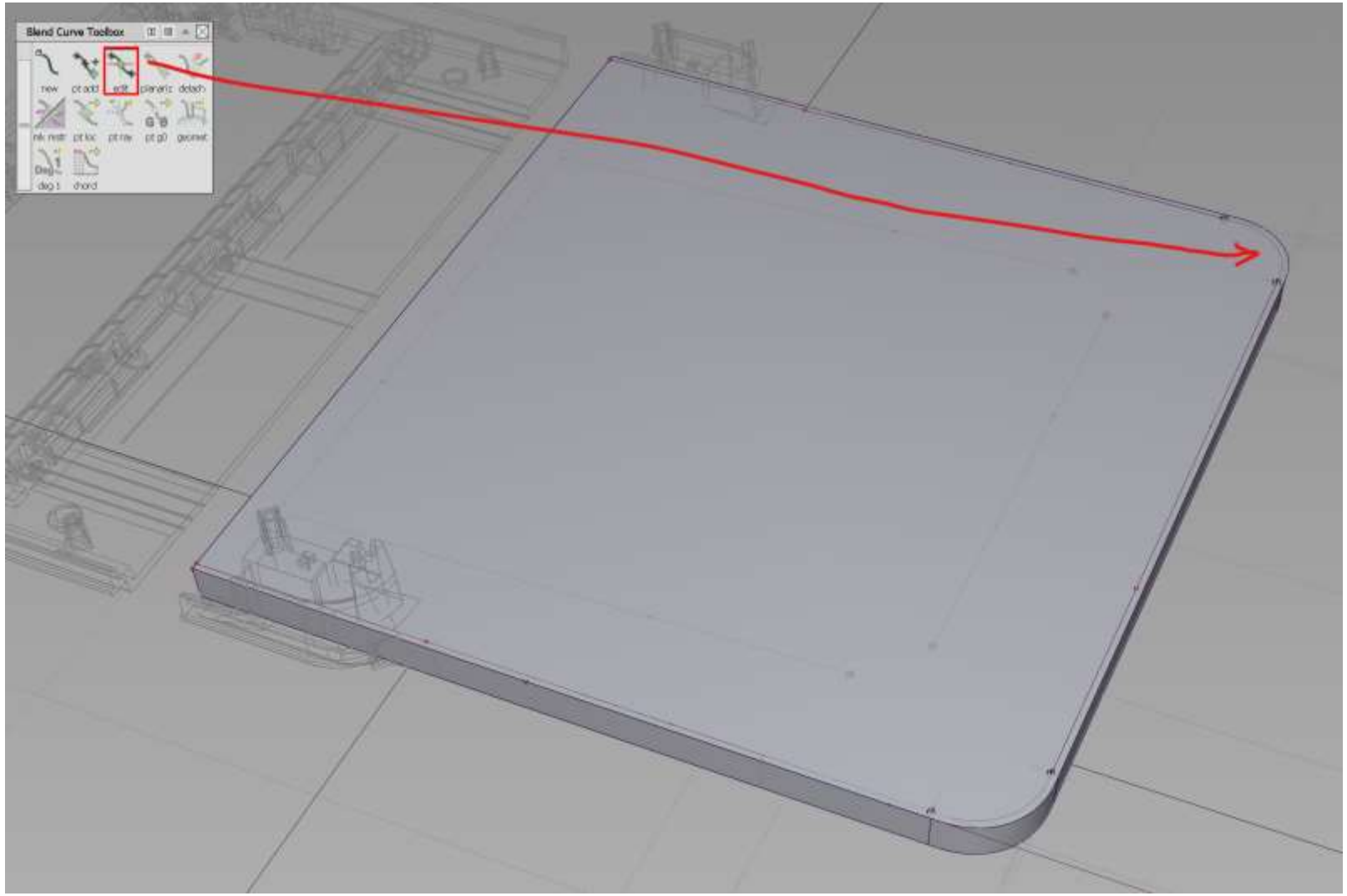


Offset edge curves 2mm – trim even with tangency

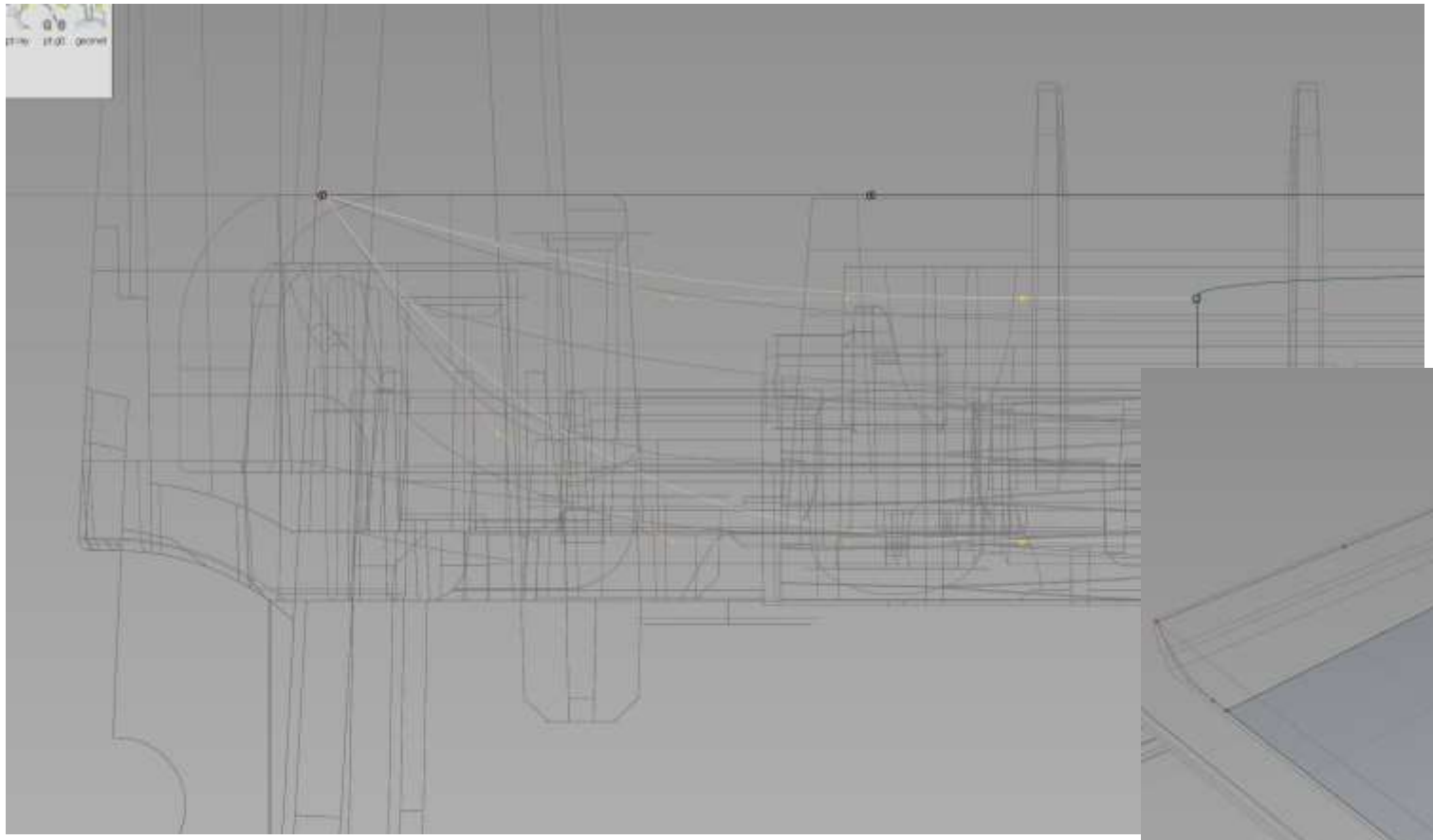


Dish area is offset ~2mm on Vasari PLUS

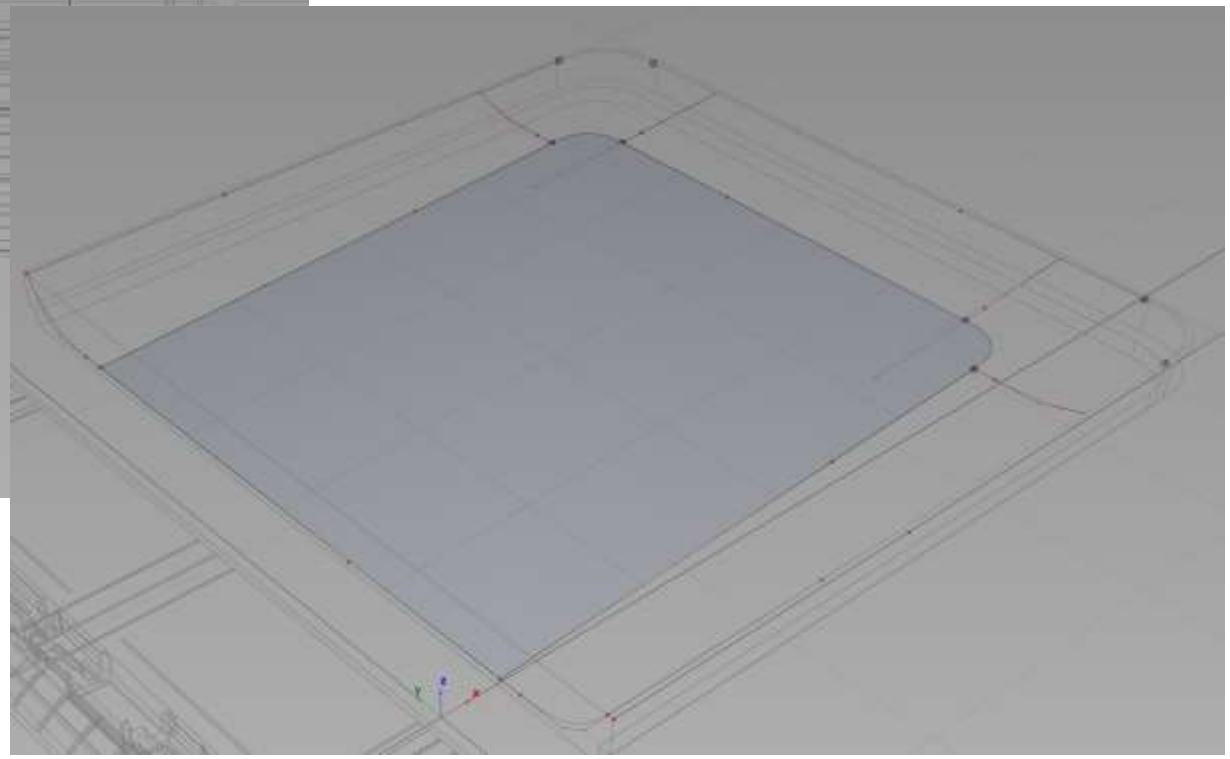
Biased EDIT BLEND CURVE = .78 x2

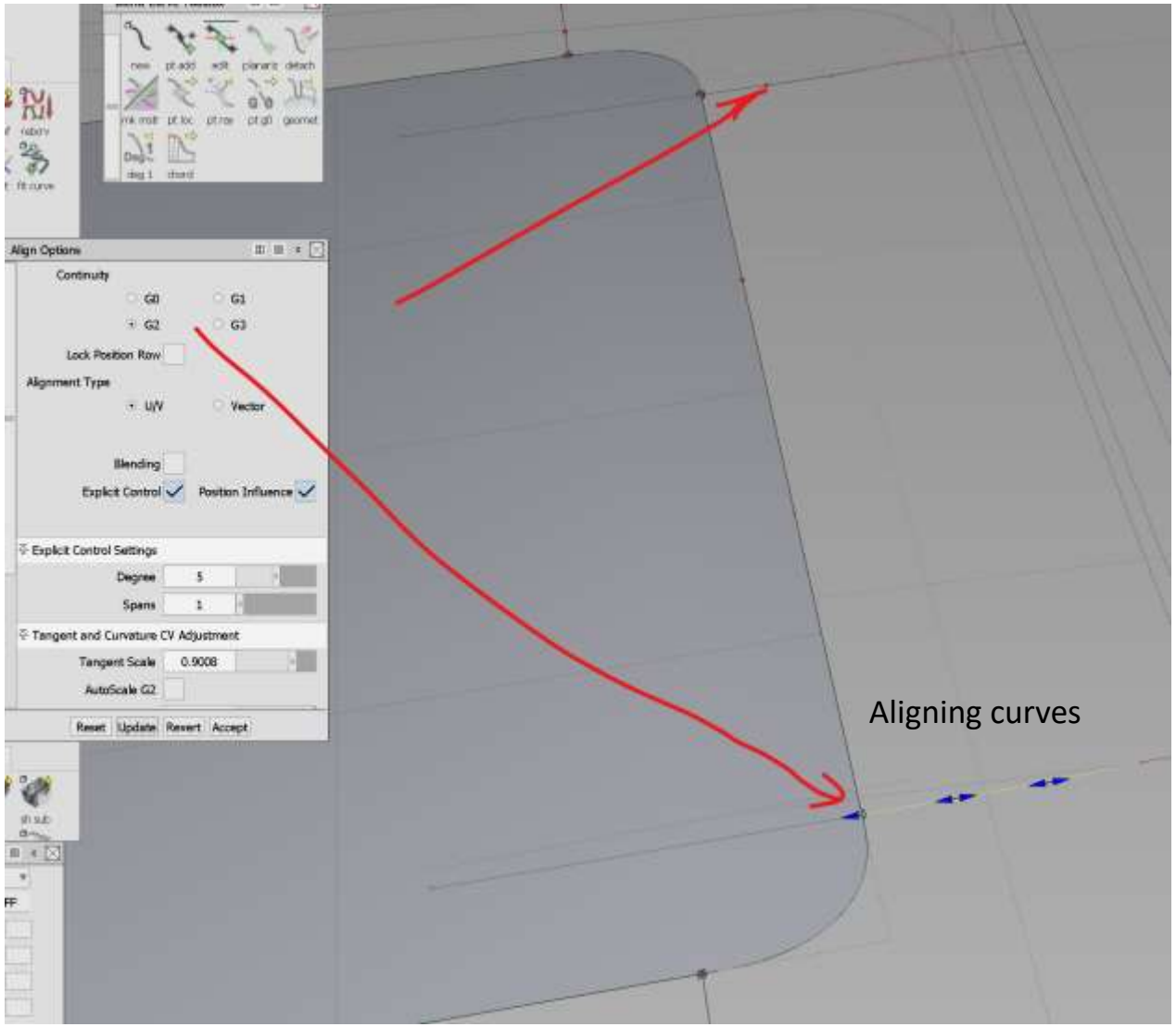


Snap moved first 3 floating CV to align with flat ramp

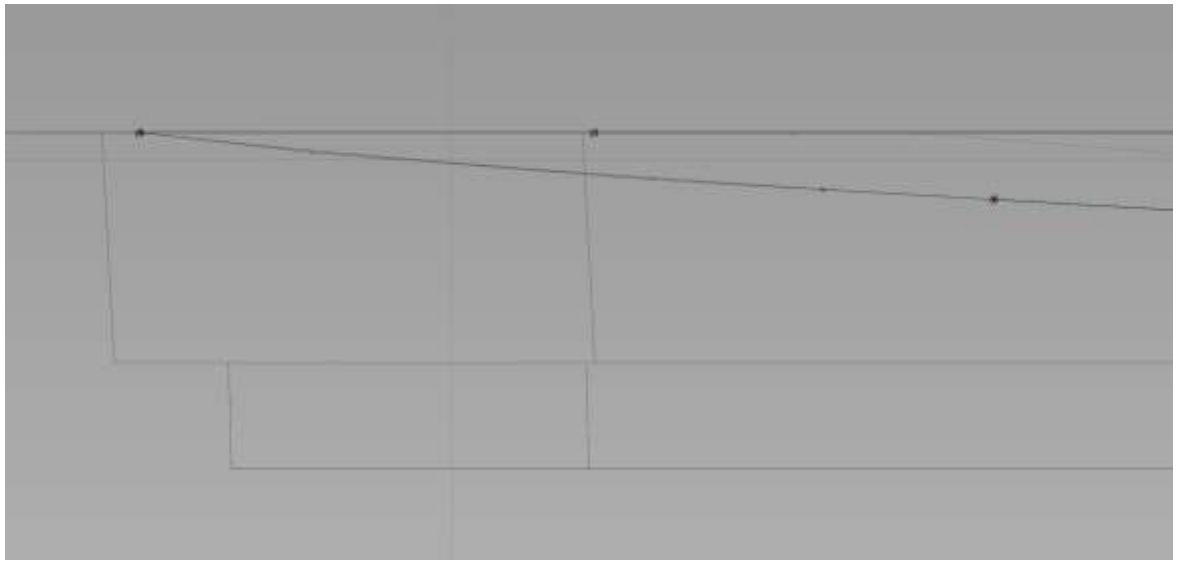


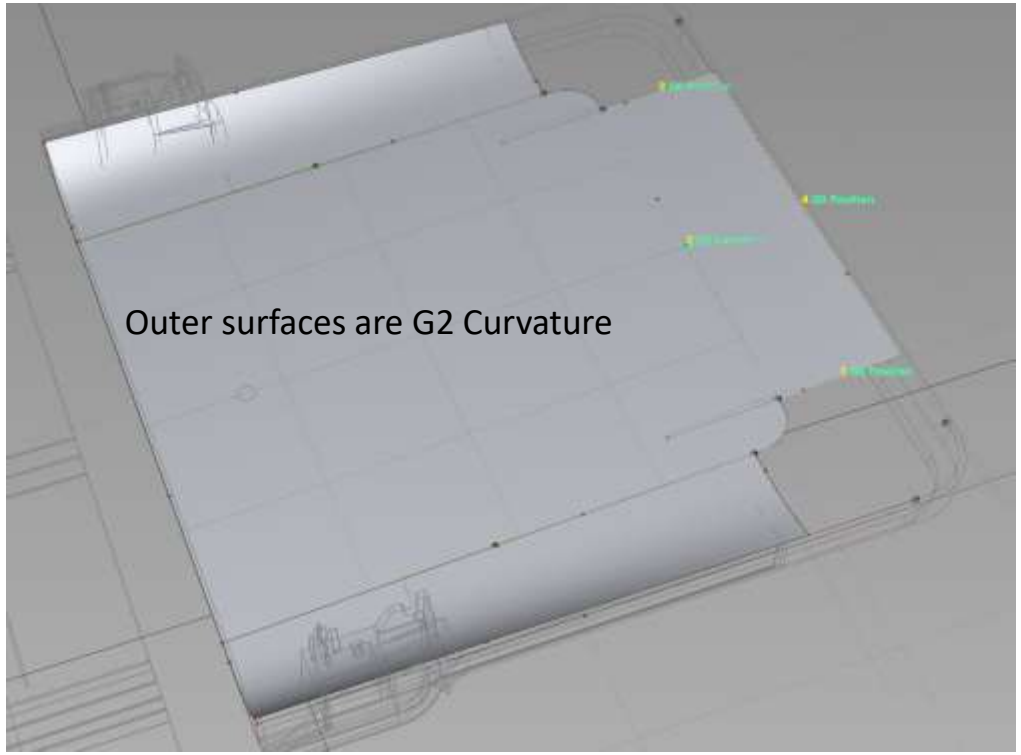
Dish curves are aligned with flat ramp



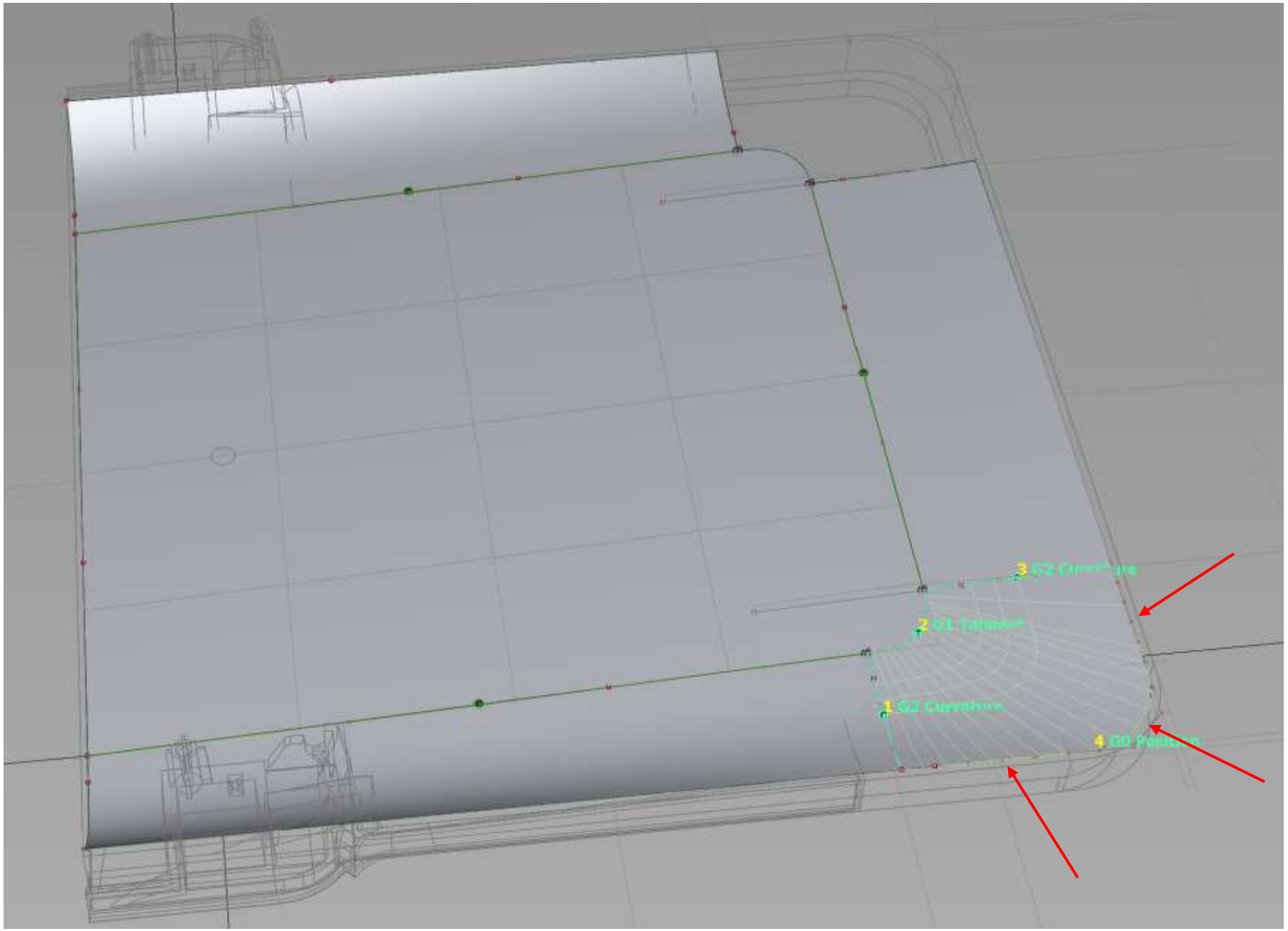


Aligning curves



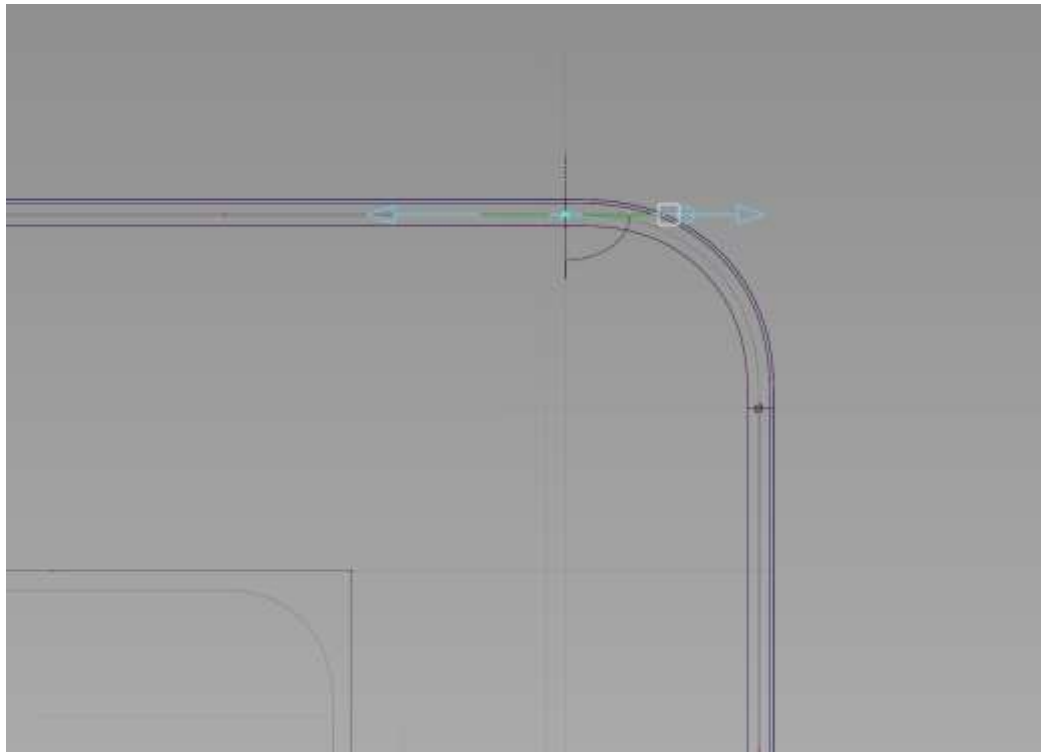


Outer surfaces are G2 Curvature

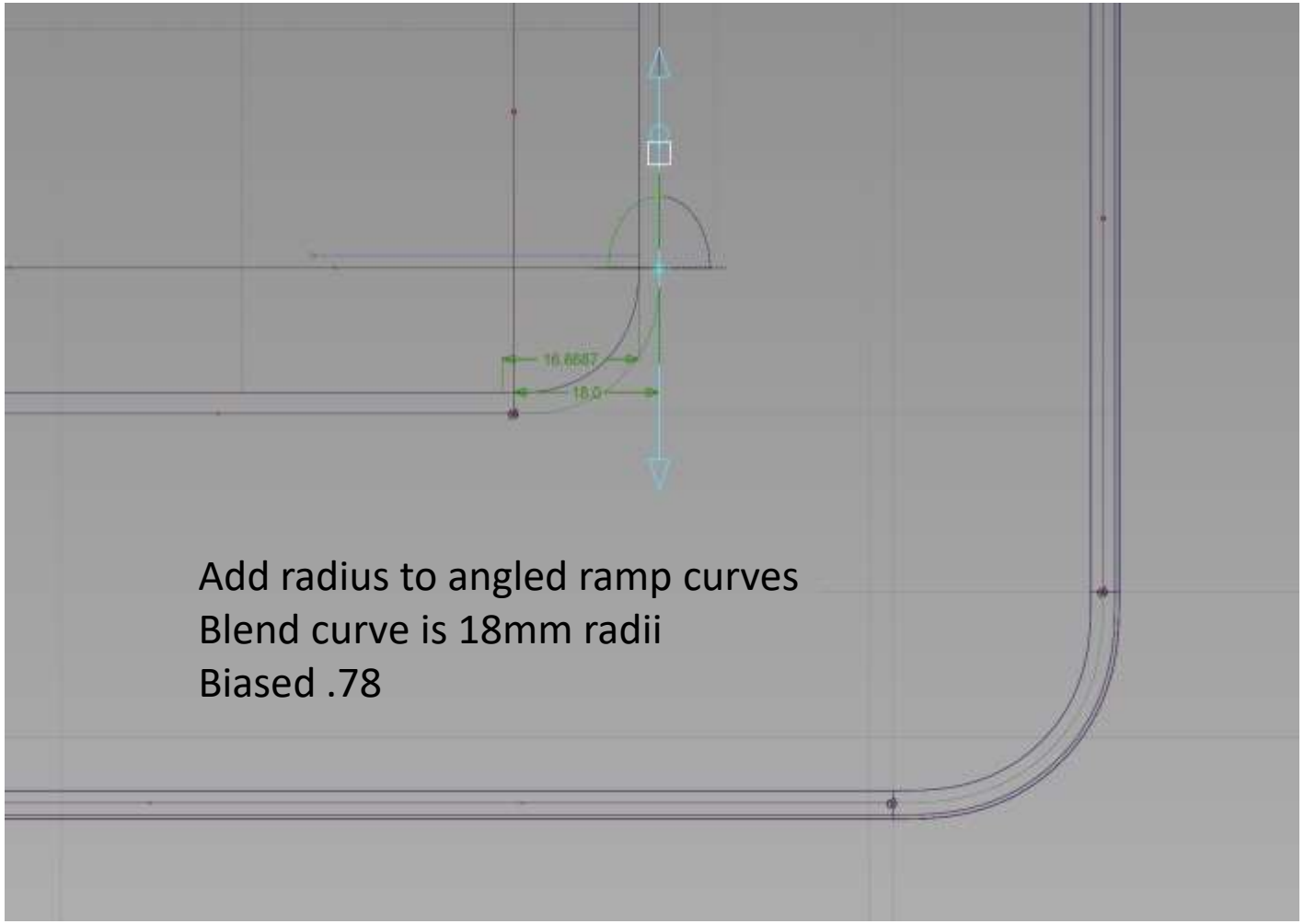


Made duplicate of these three curves
Trimmed curves
Attached outer three curves to ONE curve so I could use Square Tool

ADF Dish – for color dish 1

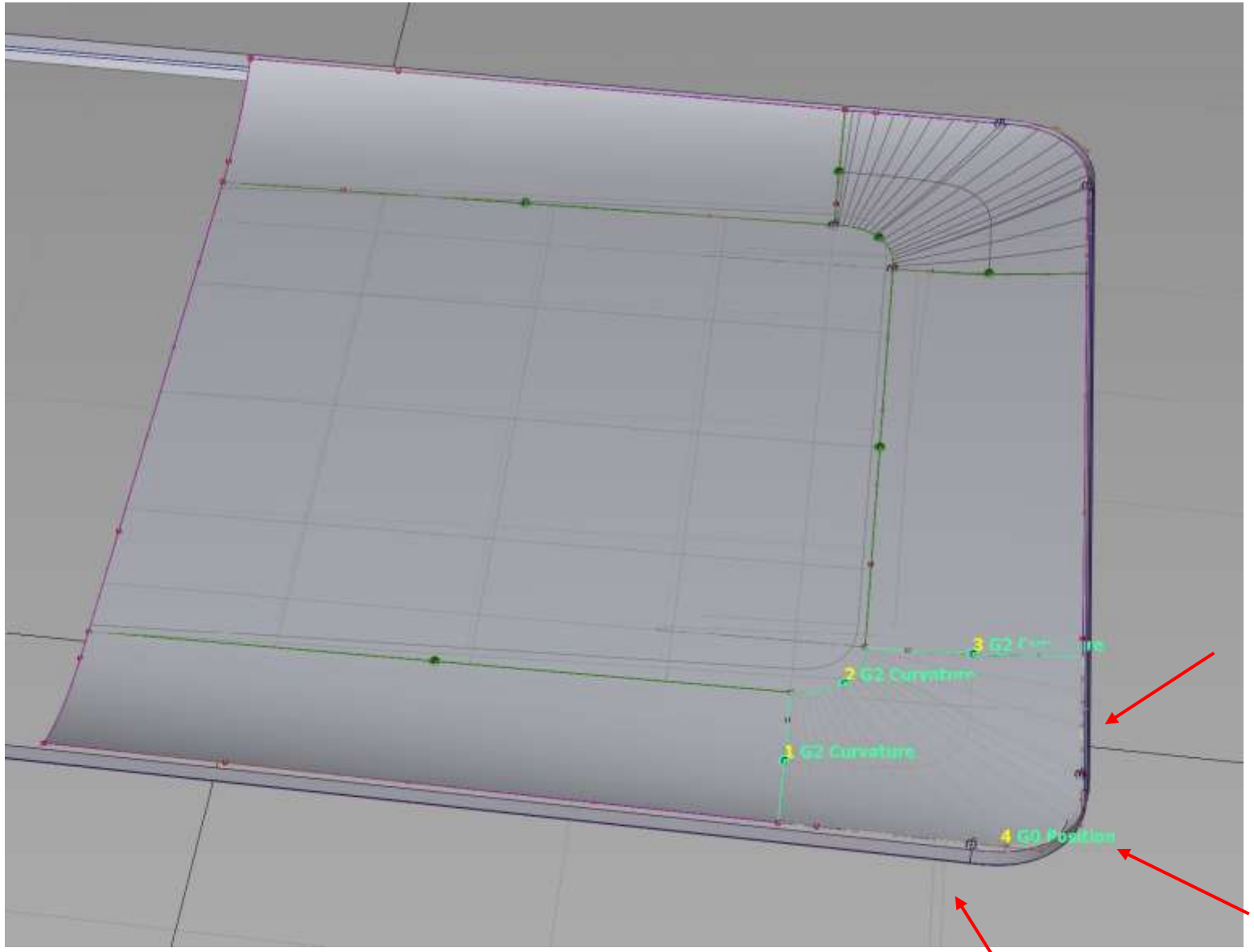


Created offset lines at 2mm
Trimmed at tangency
Added Blend Curve
Biased .80 (click on box manipulator)

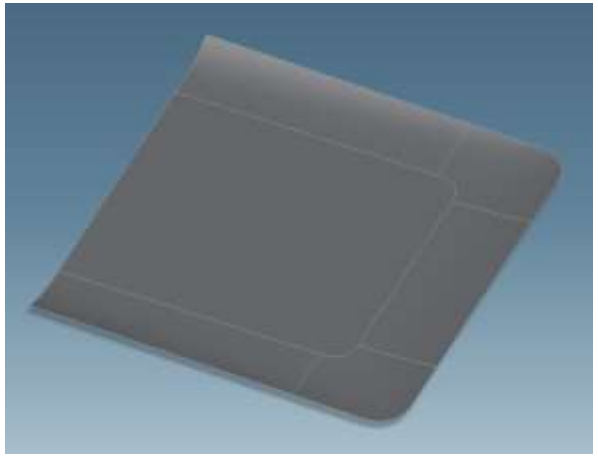


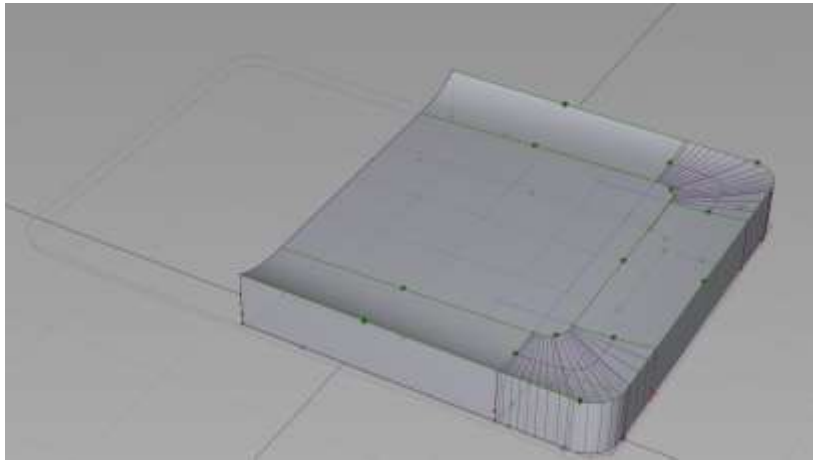
Add radius to angled ramp curves
Blend curve is 18mm radii
Biased .78

ADF Dish – for color dish 1



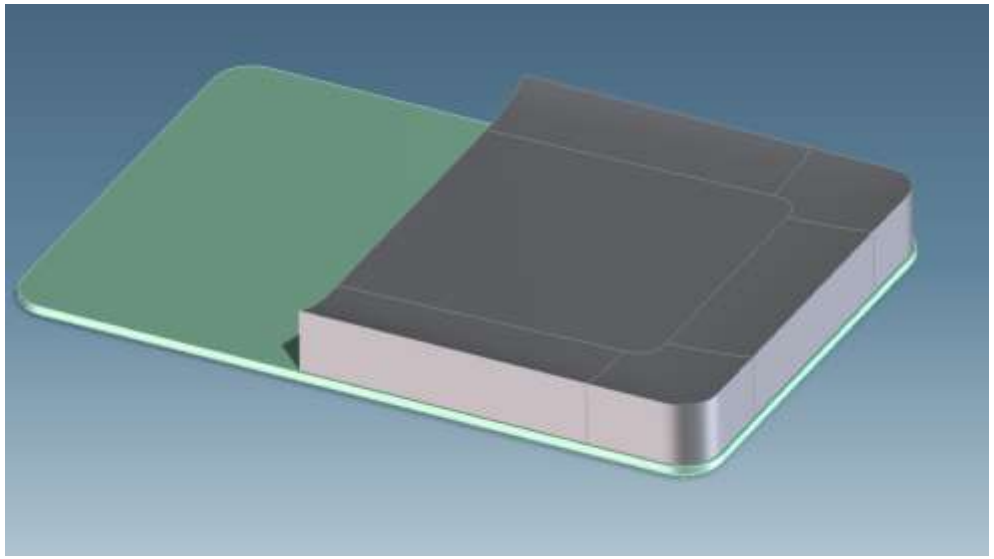
Made duplicate of these three curves
Trimmed curves
Attached outer three curves to ONE curve so I could use Square Tool



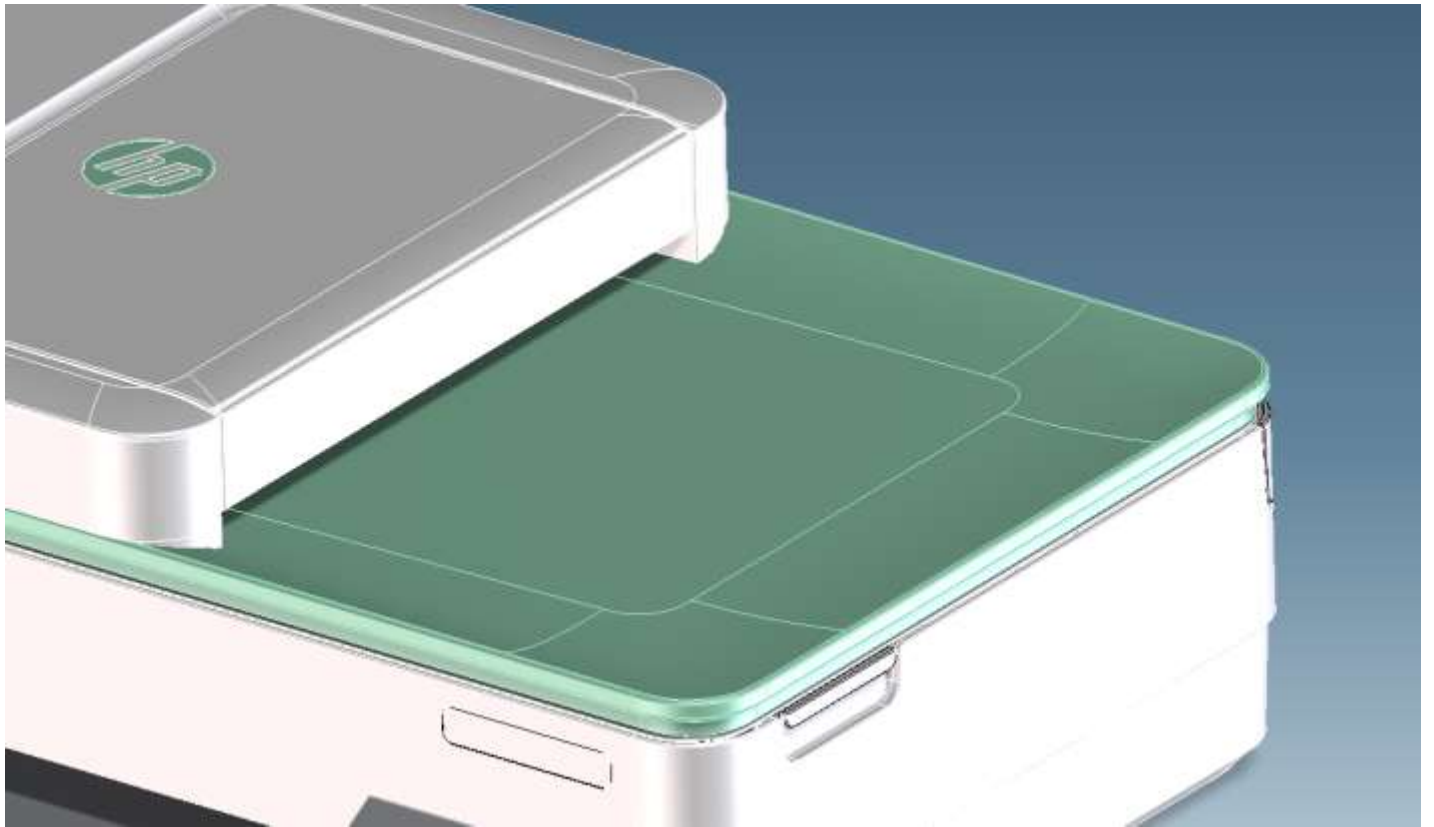


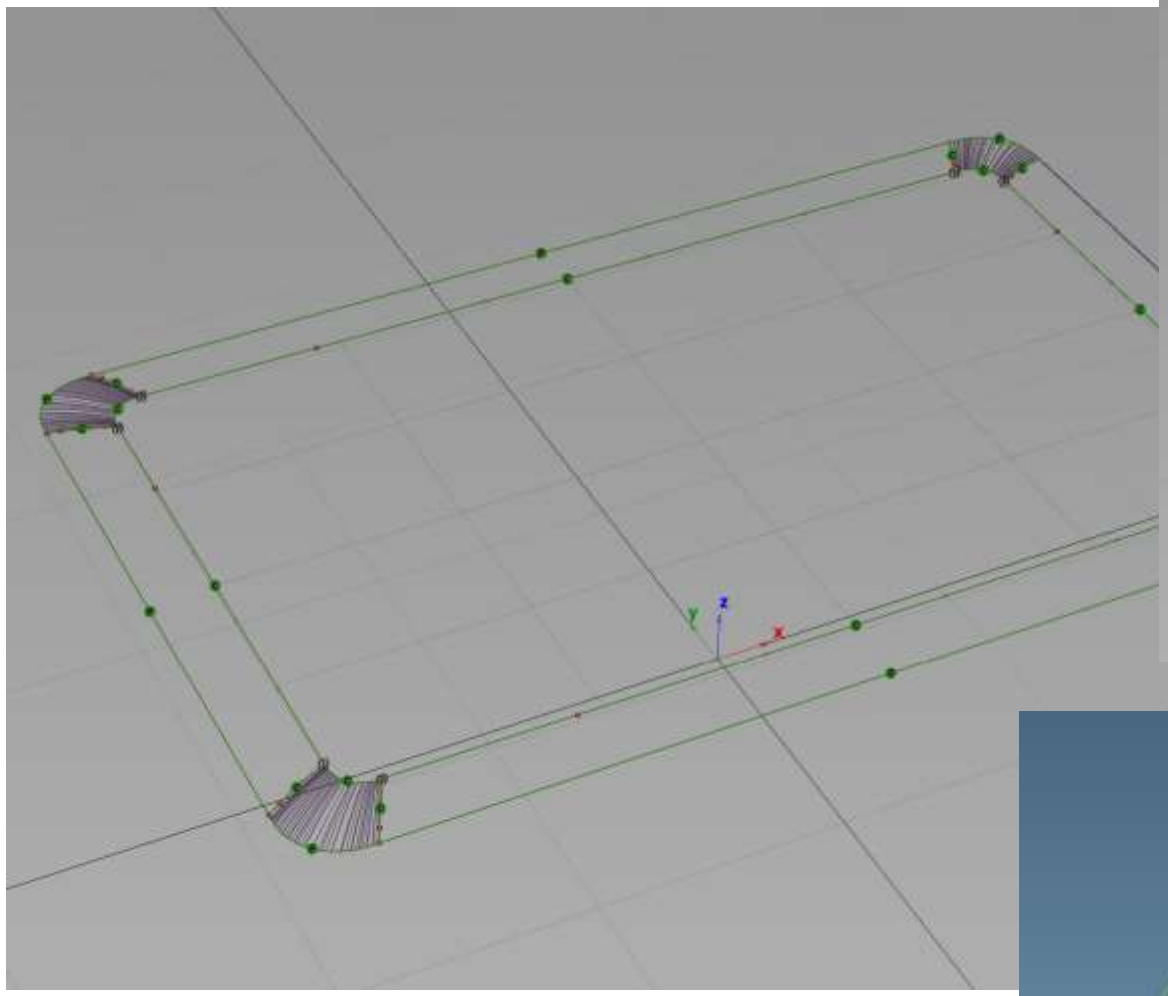
Created solid in Alias. Stitched, exported as iges to CREO

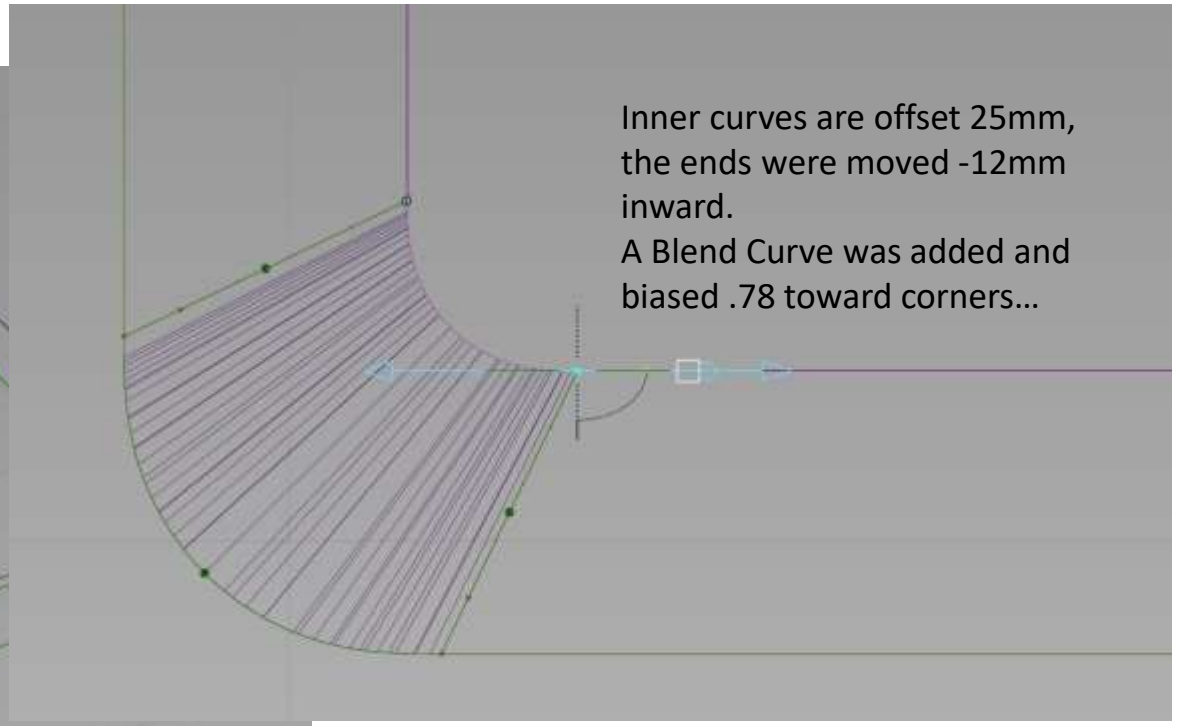
Subtool – Color-dish1

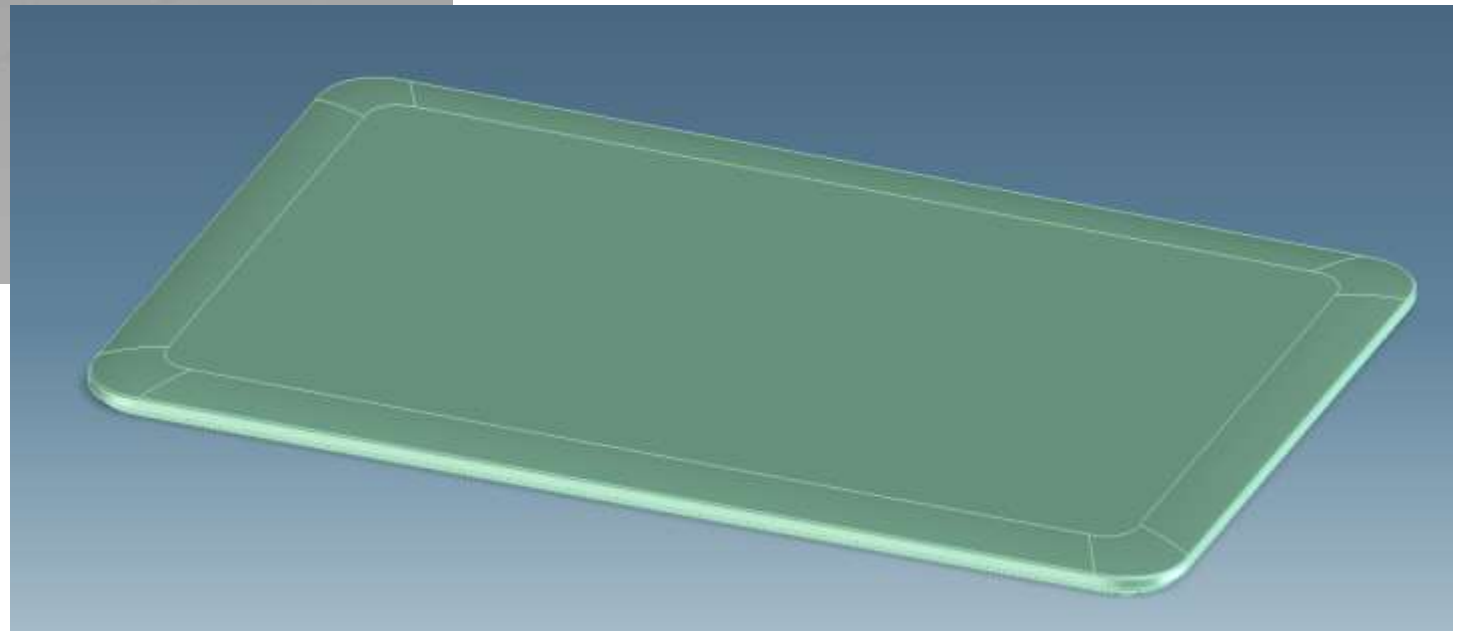


Boolean and added radii



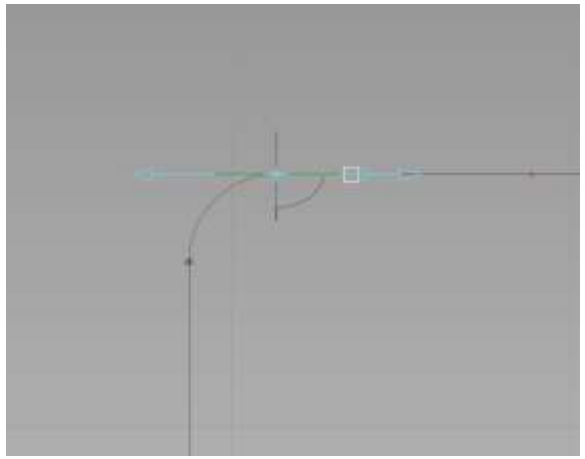


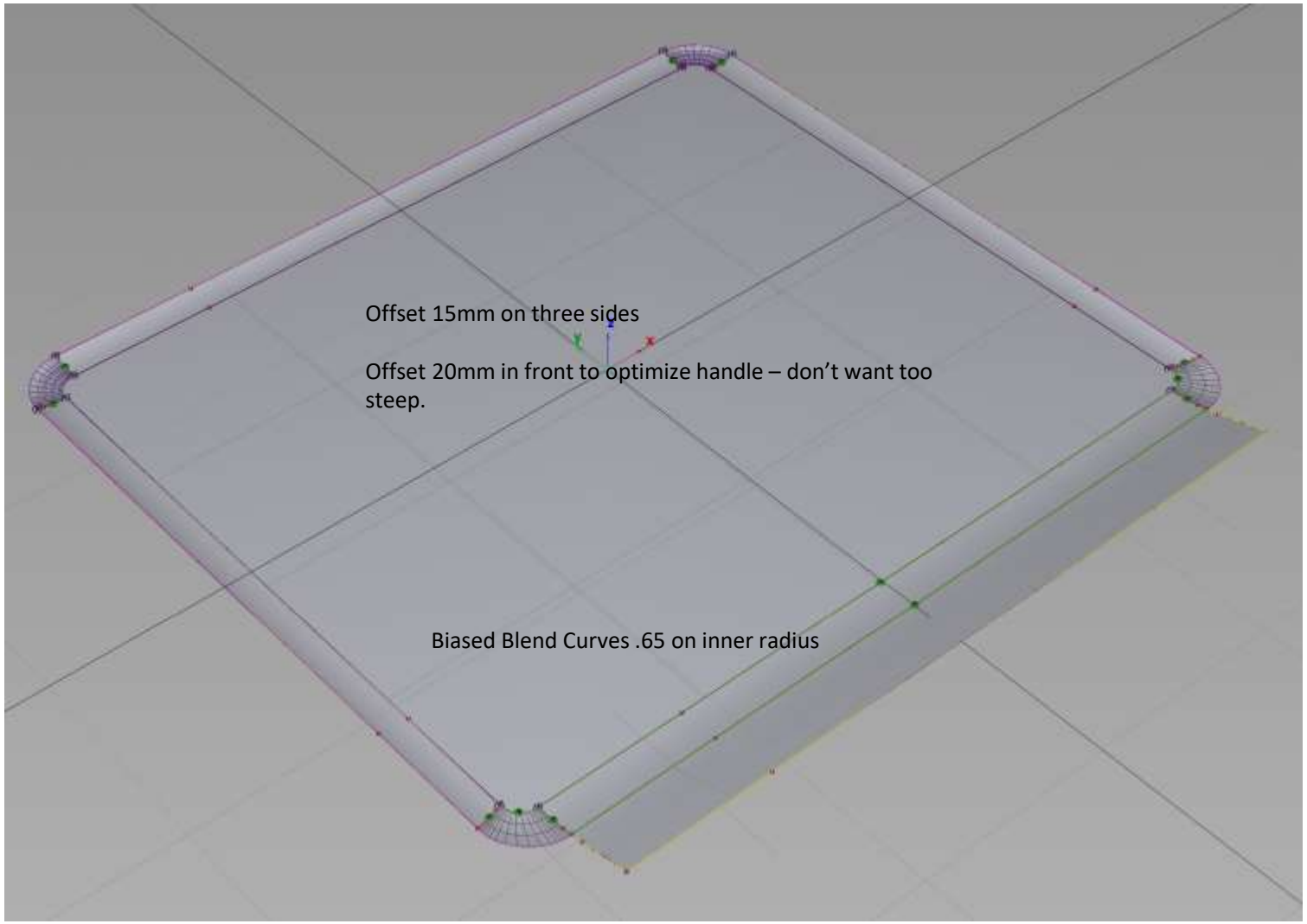

Inner curves are offset 25mm,
the ends were moved -12mm
inward.
A Blend Curve was added and
biased .78 toward corners…



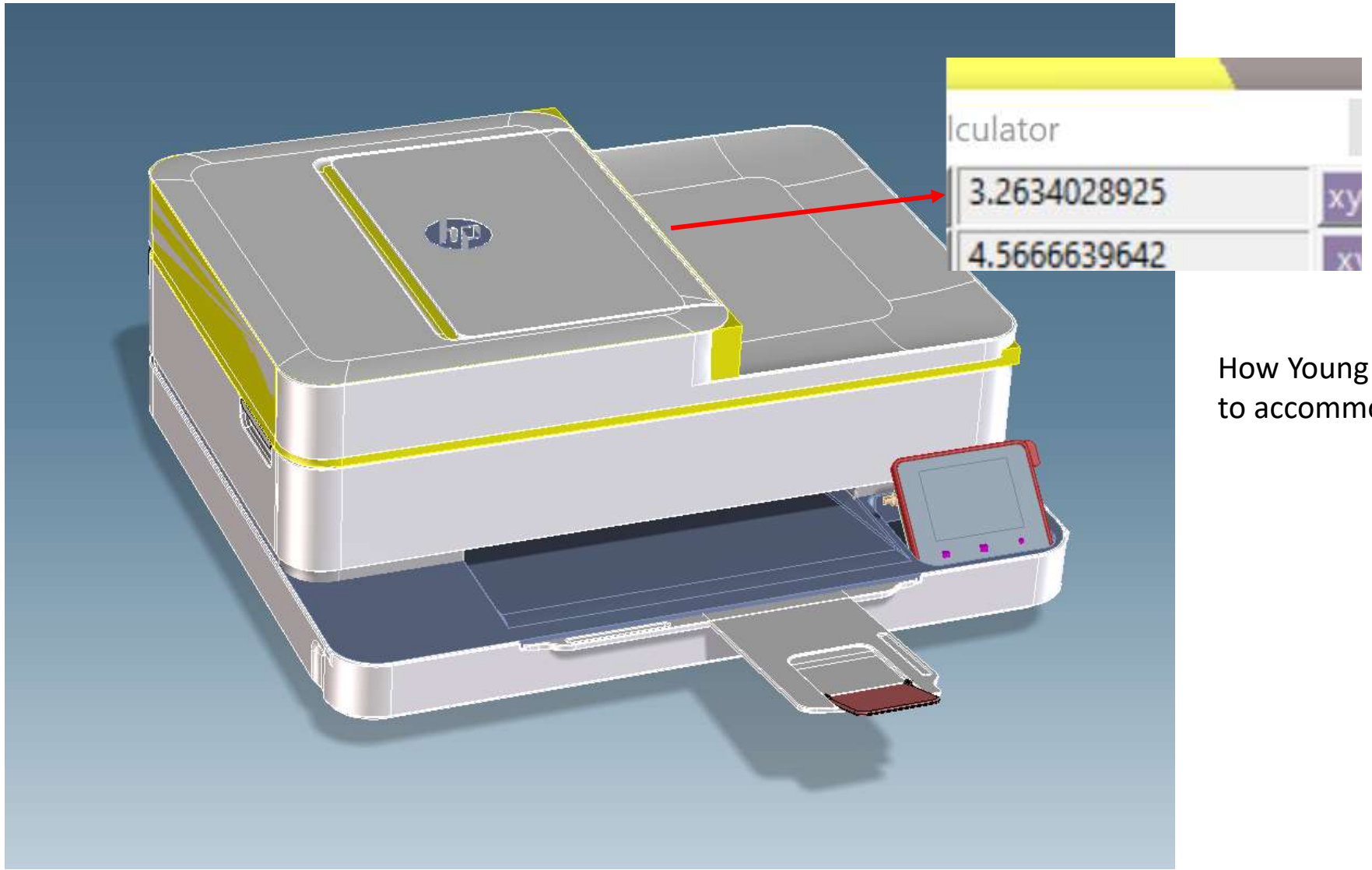
Small Size Output deck dish

Top view- created Blend Curve. Edit bias .67 to closely match curvature of CREO part





Relocating CAD to correct location - same space as MM and How Young's ADF…



How Young moved right side ADF to accommodate 28mm radii

Relocating CAD to correct location - same space as MM and How Young's ADF…