WELCOME TO THE

WEBINAR SERIES

- This Webinar is being presented from a computer with a resolution of 1280 X 1024.
- Using a similar setting on your machine may improve your viewing experience.
- The webinar will start at 12 noon Central/1:00 PM Eastern

FY 2021 Webinar #3
BcT Enhancements

February 23, 2021

FY 2021 Webinar #3, BcT Enhancements

Moderator:

- Clark Morrison, North Carolina Department of Transportation; Chair
- Hari Nair, Virginia Department of Transportation; Co-chair

Presenters:

- Harold Von Quintus, ARA
- Wouter Brink, ARA
- Yanbin Zhang, ARA

Presentation will be available for viewing on the ME-Design Resource website:
http://www.me-design.com

Pavement ME Task Force Members

1. Clark Morrison, PE, North Carolina DOT, Chair
2. Ryan Fragapane, AASHTO Project Manager
3. Hari Nair, PE, Virginia DOT, Vice-Chair
4. Felix Doucet, Eng., Quebec MOT
5. David Holmgren, PE, Utah DOT
6. Patrick Bierl, PE, Ohio DOT
7. Dulce Feldman, PE, California DOT
8. Kumar Dave, PE, Indiana DOT
9. Susanne Chan, Ontario MOT, TAC Liaison
10. Tom Yu, PE, FHWA Liaison

FY 2021 Webinar #3, BcT Enhancements

- Phones are being muted.
- Please post your questions in the Q&A box. This can be accessed by clicking on the Webex Q&A button.
- The presenters will answer all questions at the end of the webinar/demonstration as time permits.
- Questions not answered, because of time, will be responded to separately.

FY 2021 Webinar #3 BcT Enhanements

Poll 1: Questions 1, 2, and 3

1. How many individuals are viewing this webinar at your location?
   - 1
   - 2
   - 3 to 5
   - More than 5
2. What is your affiliation?
   - State Government
   - Federal Government
   - Contractor/Association
   - Consultant
   - Academia

3. What type of deflection equipment is typically used by you or your organization?
   - Dynatest Version
   - Kuab
   - JILS
   - Another device is used
   - Do not use deflection basin tests for rehabilitation design.

Prerequisites for this Webinar

Prior experience with:

- FWD deflection basin testing.
- Backcalculation of elastic layer modulus values.
- Using a backcalculation software tool, preferably the BcT.

Learning Outcomes

1. Apply layer thickness data in the segmentation process using the BcT.
2. Determine the pavement structure simulation used in backcalculation.
3. Evaluate the results from the BcT backcalculation process for use in rehabilitation design.

FY 2021 – Webinar 3: BcT Enhancements

Outline of today's webinar:

1. Introduction; Overview of BcT Enhancements
2. Demonstration of BcT Enhancements
3. Summary and Closing Comments
4. Question and Answer Session

BcT Enhancements

1. Added *.mdb format for deflection data.
2. Added layer thickness input file.
3. Added sensor spacing file button.
4. Added chart to display layer thicknesses, along with layer definition table.
5. Layer thickness automatically populated in structure simulation, if thickness file available.
6. Stiff or rigid layer button added to structure definition.
7. Depth to rigid layer display chart added.
8. Temperature correction feature added.
9. Export to BcT data file added.

BcT software and documentation can be downloaded from AASHTWare web site http://www.me-design.com

How do we get the BcT?

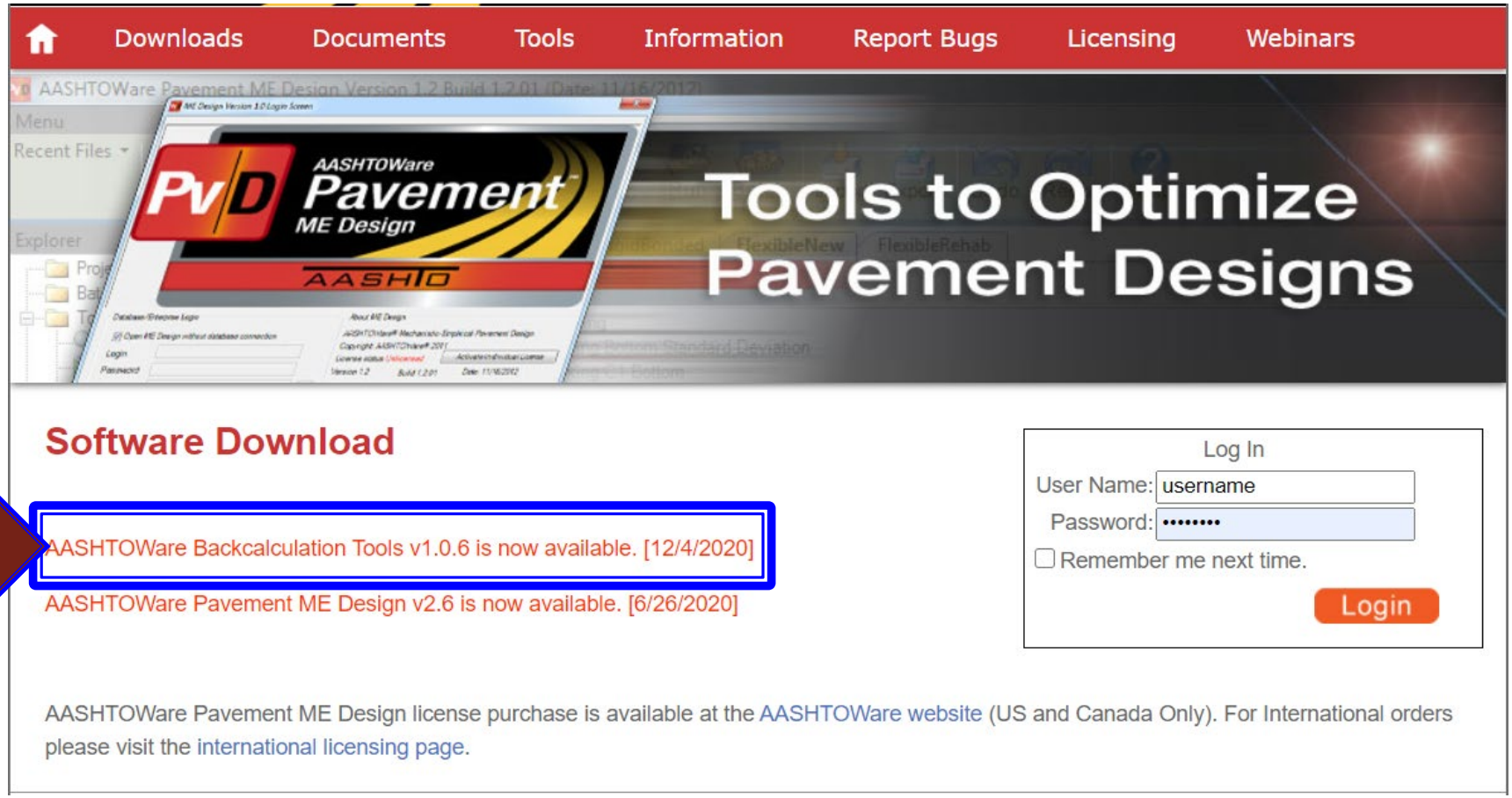
1. Included in AASHTOWare PMED License

2. Standalone single user purchase

   Annual license fee: $1,250

Link to AASHTOWare Purchasing

BcT Software



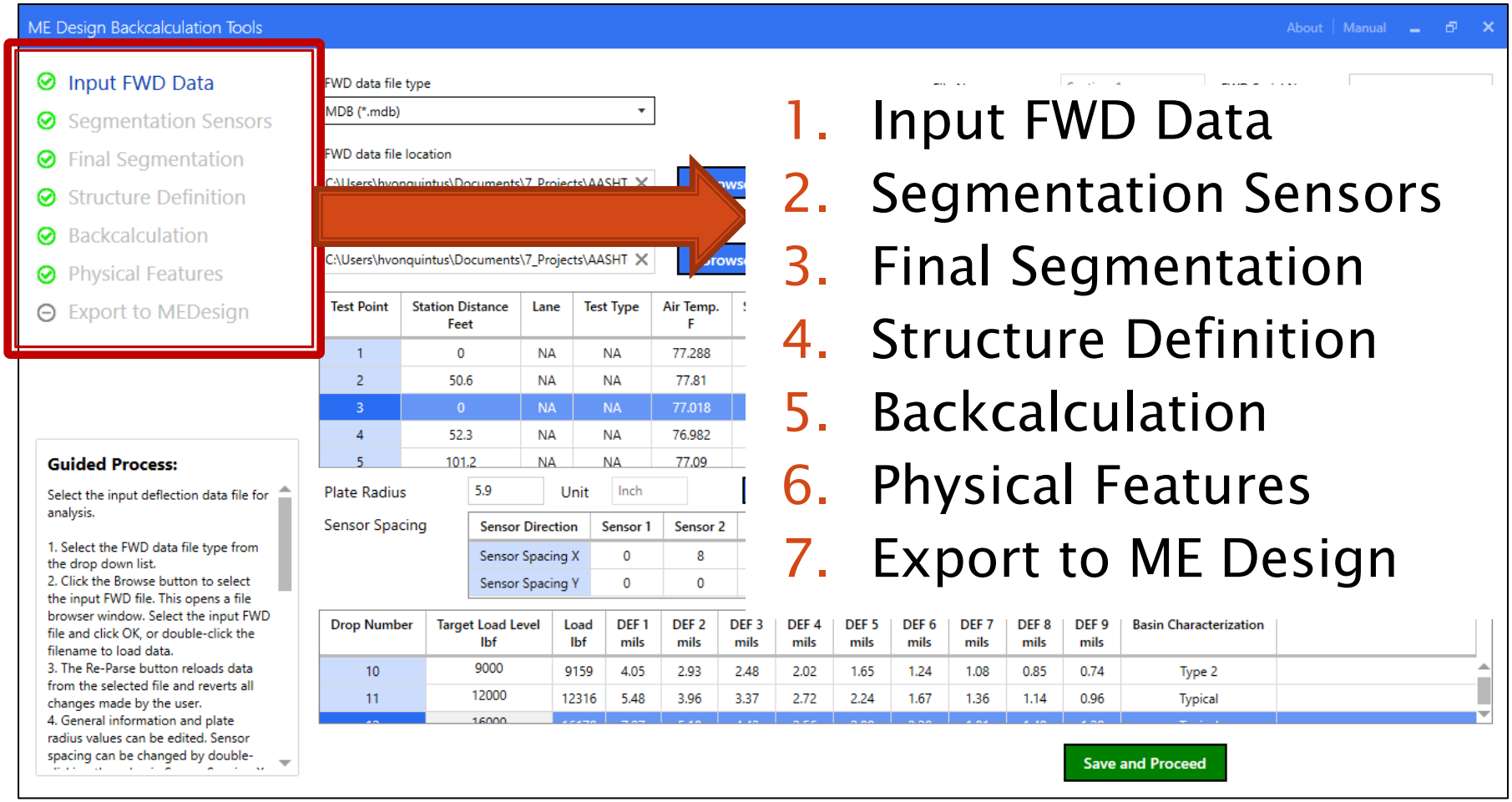
SOFTWARE INSTALLATION AND LICENSING

- Software and Hardware Requirements
- Software Download
- Software Licensing and Activation
- Database Resource Documents
- Example ME Design Projects
- Backcalculation Tools

To install AASHTOWare Backcalculation Tools on your computer, extract the files included in the AASHTOWareBackcalculationToolsInstaller.zip file to a temporary directory. Run the AASHTOWare - Backcalculation Tools Installer.exe [v1.0.6] file from the temporary directory and select install. An installation walkthrough and step-by-step instructions for license activation can be found here. Please note that v1.0.6 requires Microsoft .Net Framework 4.8.

BcT

Overview and Features of BcT



1. Input FWD Data
2. Segmentation Sensors
3. Final Segmentation
4. Structure Definition
5. Backcalculation
6. Physical Features
7. Export to ME Design

FY 2021 – Webinar 3: BcT Enhancements

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Demonstration of BcT Enhancements

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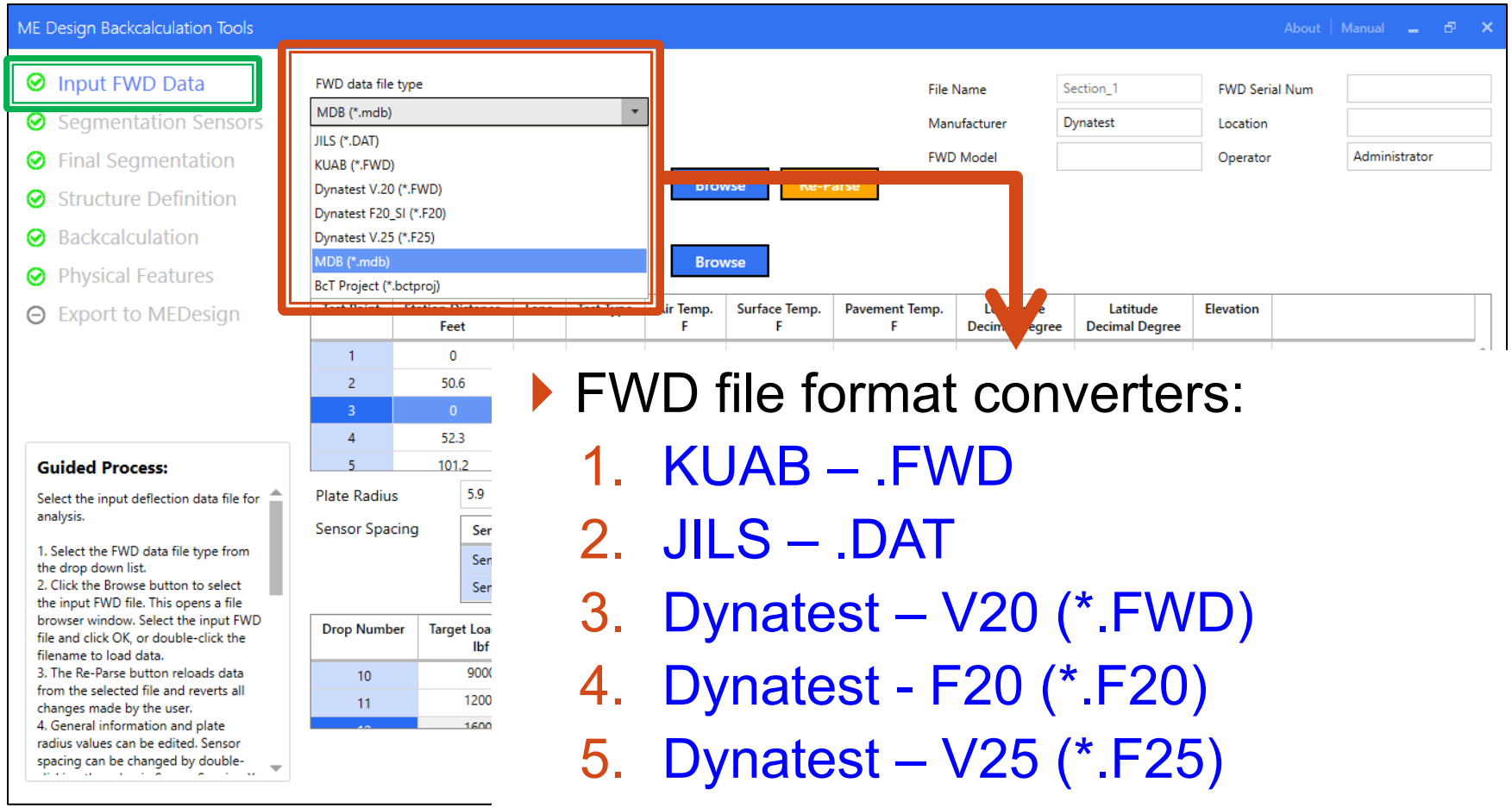
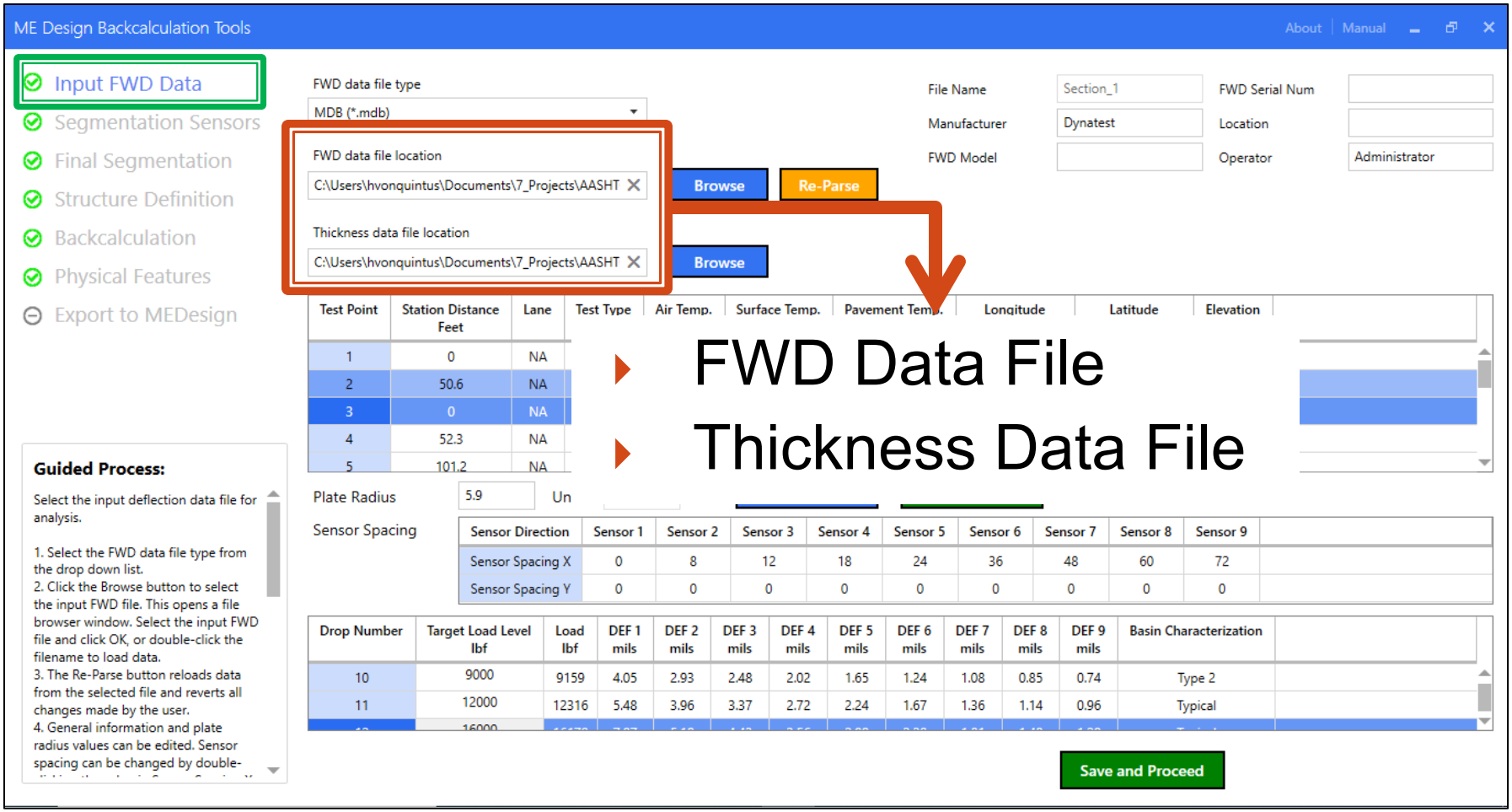
1. Import FWD Data File

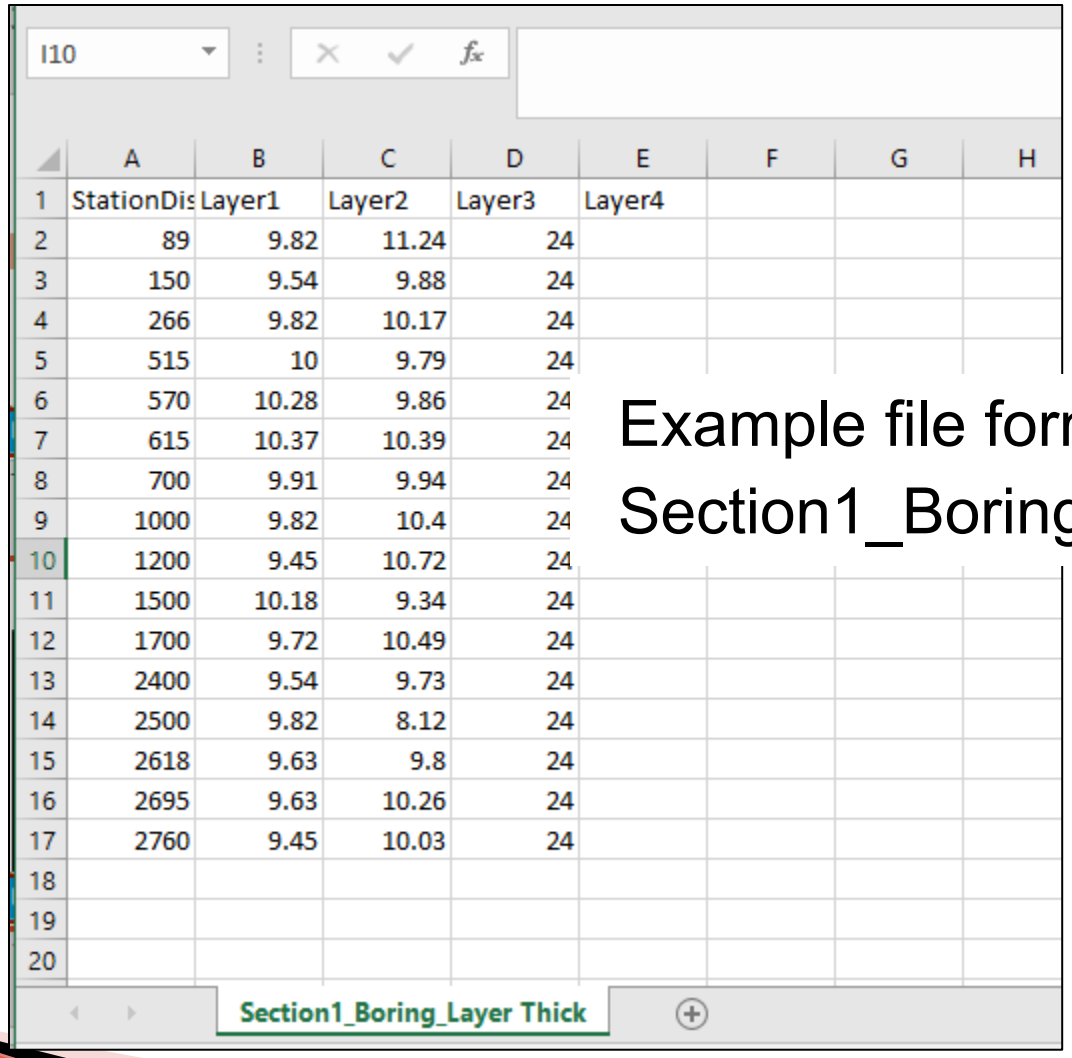


- FWD file format converters:
  1. KUAB – .FWD
  2. JILS – .DAT
  3. Dynatest – V20 (*.FWD)
  4. Dynatest - F20 (*.F20)
  5. Dynatest – V25 (*.F25)
  6. Dynatest - *.mdb

1. Import FWD Data File



1. Import FWD Data File



I10

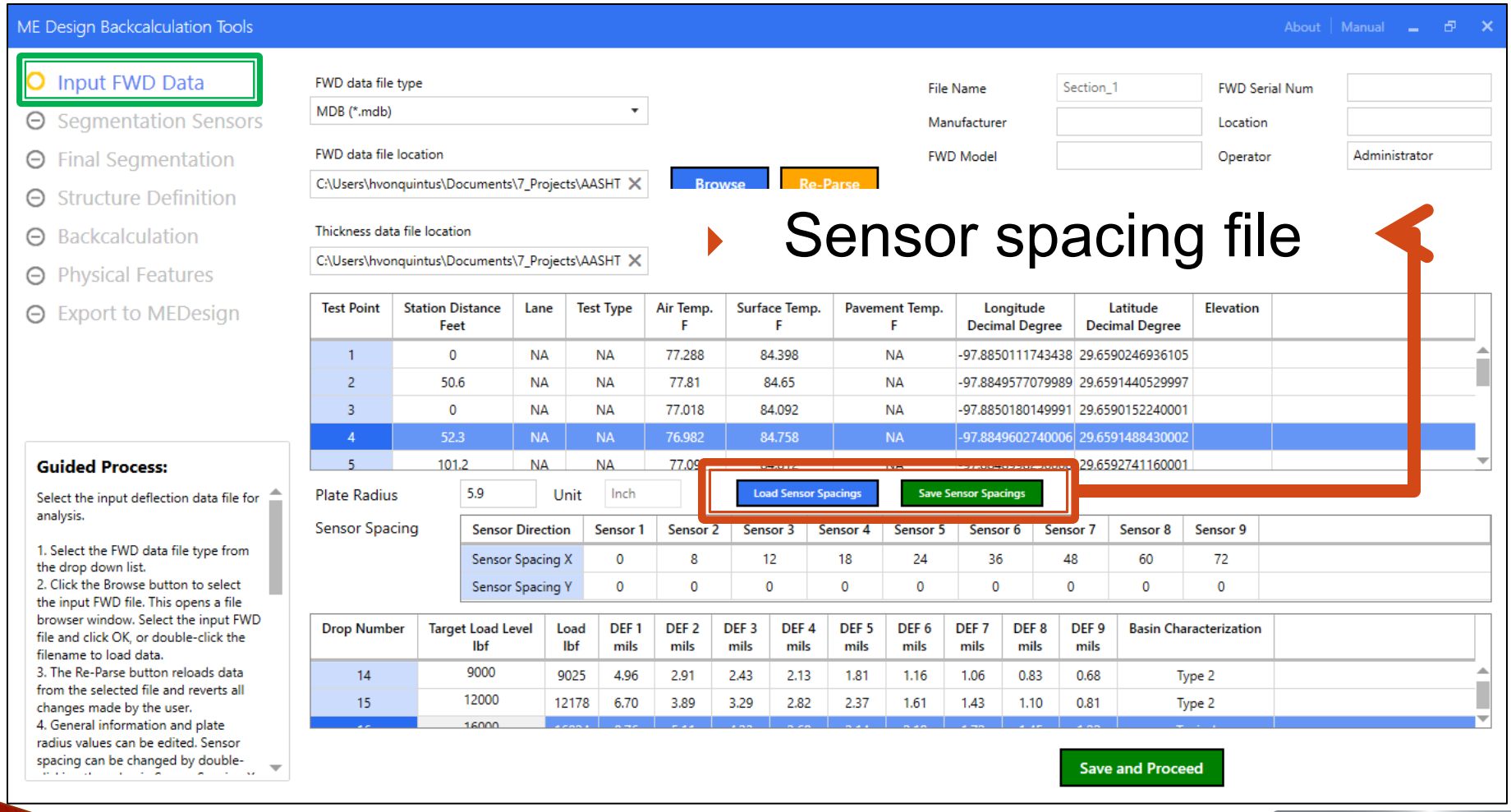
	A	B	C	D	E	F	G	H
1	StationDis	Layer1	Layer2	Layer3	Layer4			
2	89	9.82	11.24	24				
3	150	9.54	9.88	24				
4	266	9.82	10.17	24				
5	515	10	9.79	24				
6	570	10.28	9.86	24				
7	615	10.37	10.39	24				
8	700	9.91	9.94	24				
9	1000	9.82	10.4	24				
10	1200	9.45	10.72	24				
11	1500	10.18	9.34	24				
12	1700	9.72	10.49	24				
13	2400	9.54	9.73	24				
14	2500	9.82	8.12	24				
15	2618	9.63	9.8	24				
16	2695	9.63	10.26	24				
17	2760	9.45	10.03	24				
18								
19								
20								

Section1_Boring_Layer Thick

Example file format:

Section1_BoringLayerThick.csv

1. Import FWD Data File



Demonstration of BcT Enhancements

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2. Segmentation Sensors

Demonstration of BcT Enhancements

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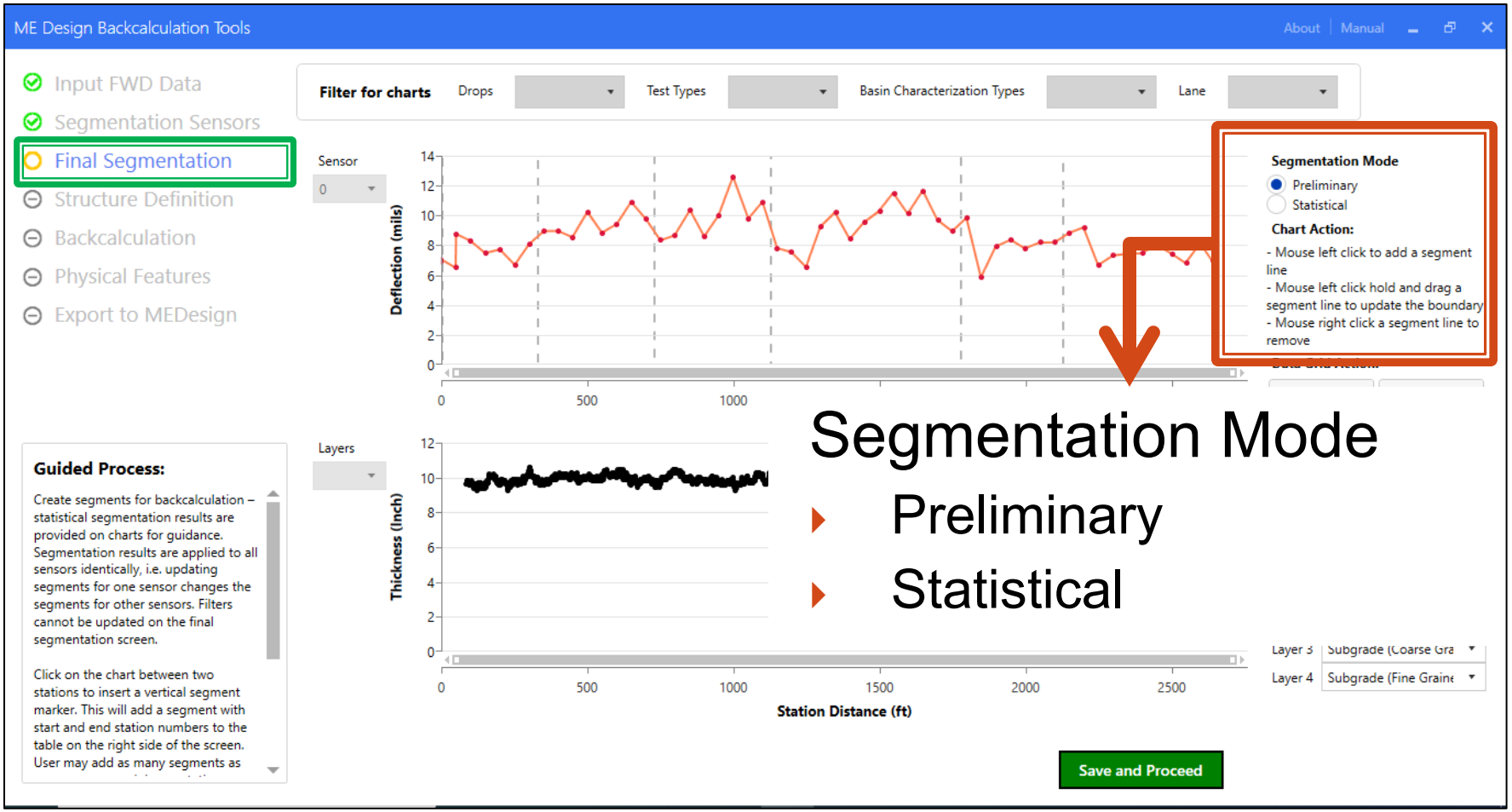
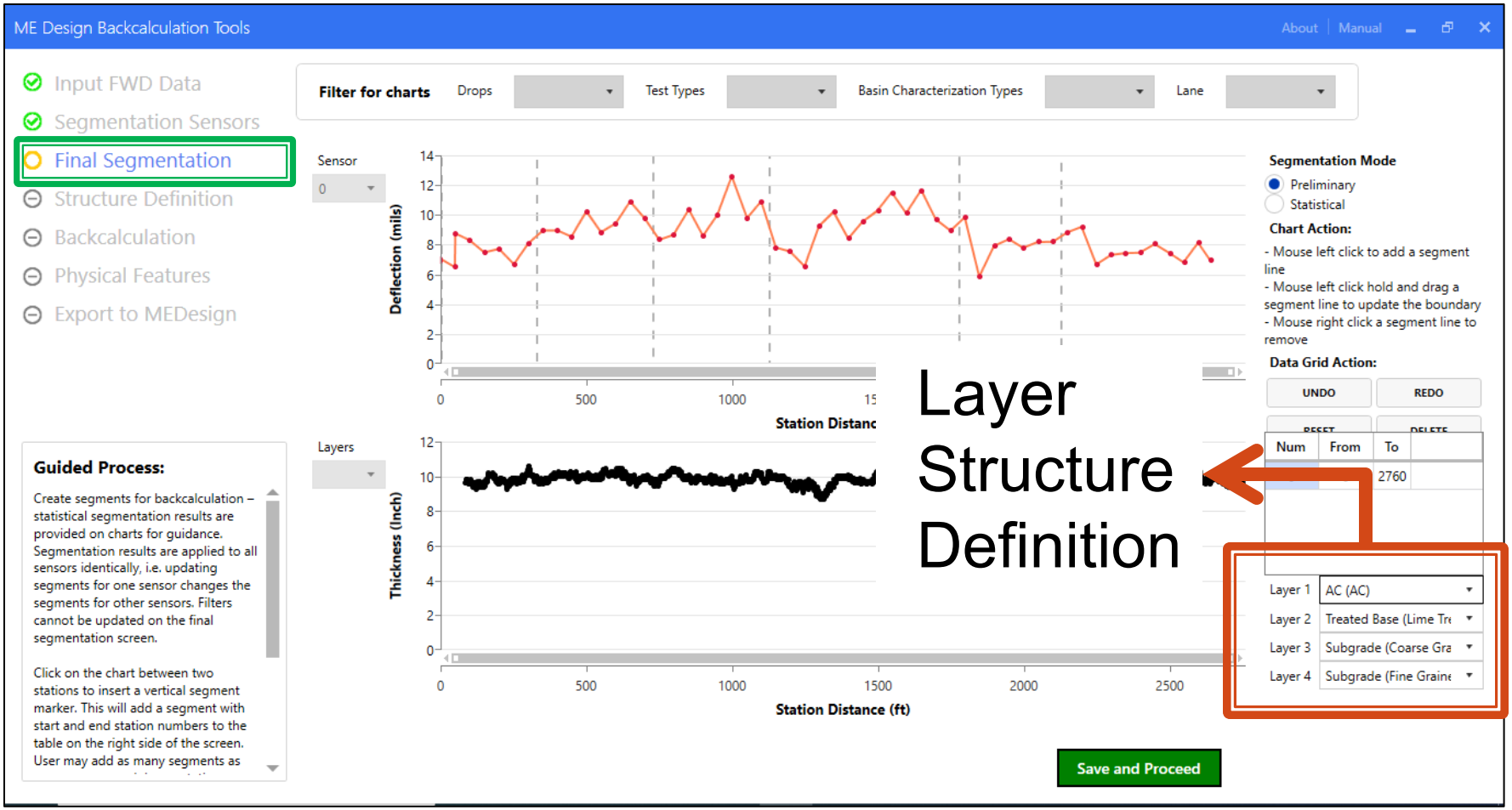
3. Final Segmentation



Segmentation Mode

- Preliminary
- Statistical

3. Final Segmentation



Demonstration of BcT Enhancements

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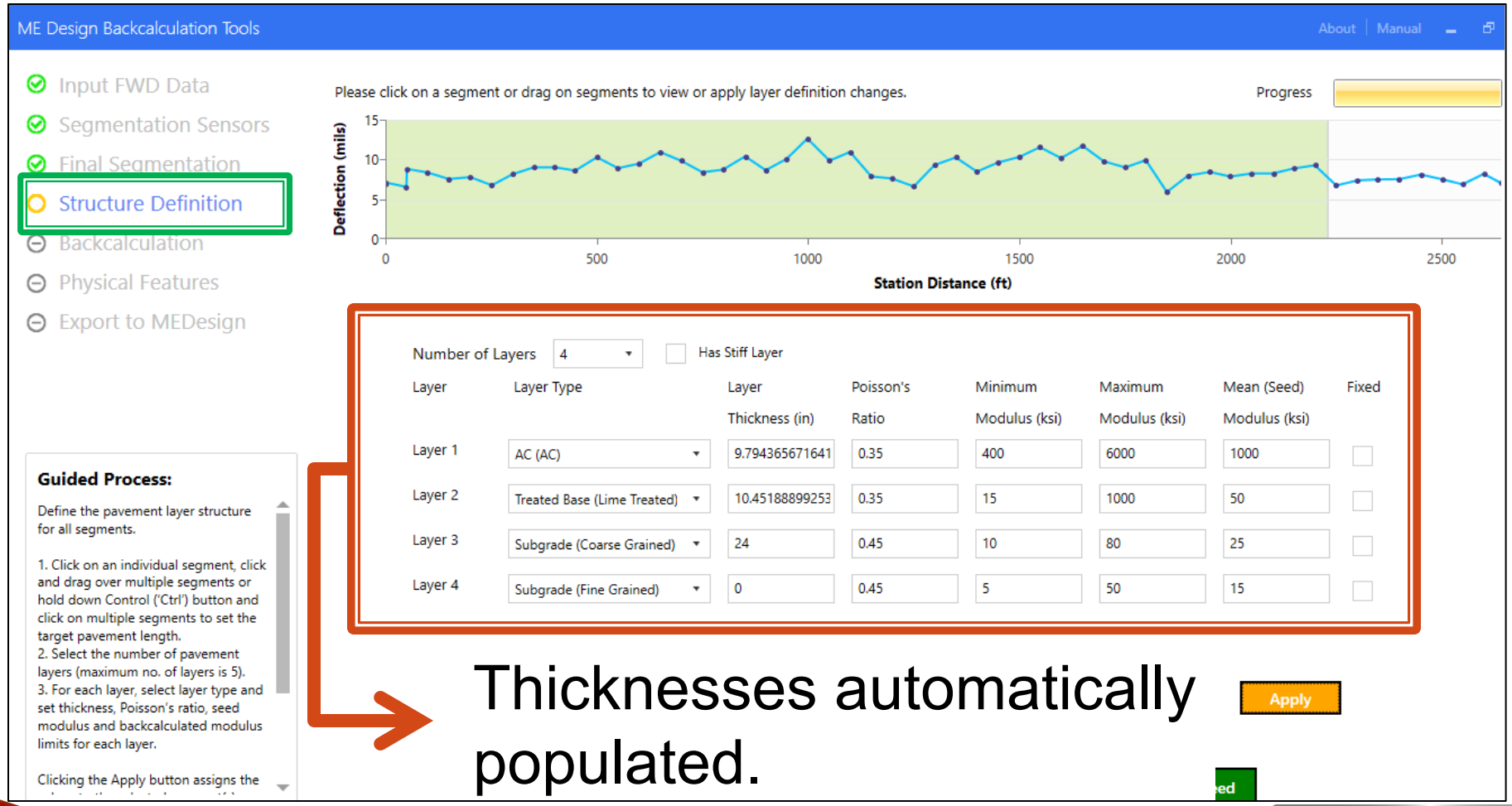
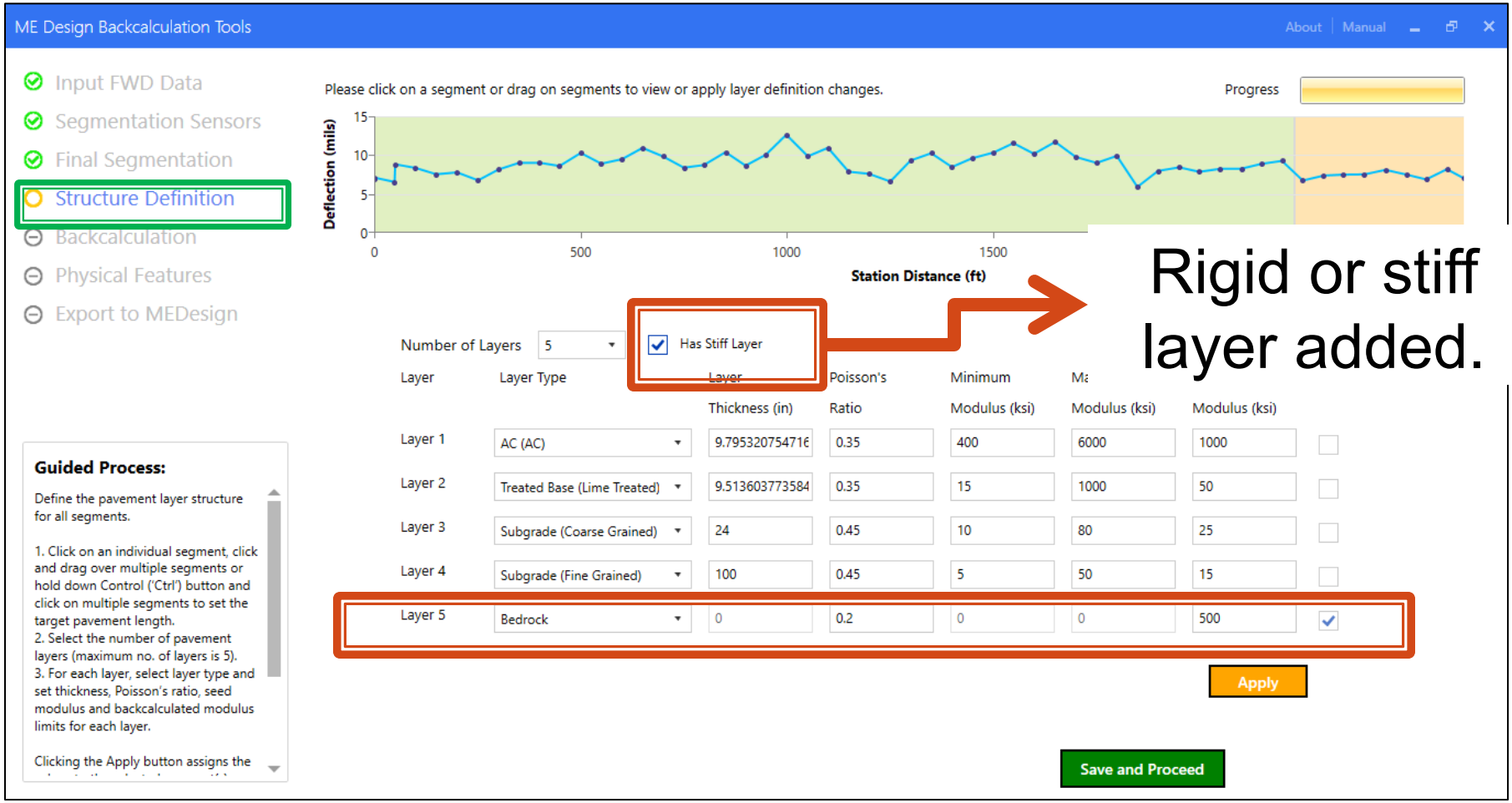
4. Structure Definition



Thicknesses automatically populated.

4. Structure Definition



Rigid or stiff layer added.

Demonstration of BcT Enhancements

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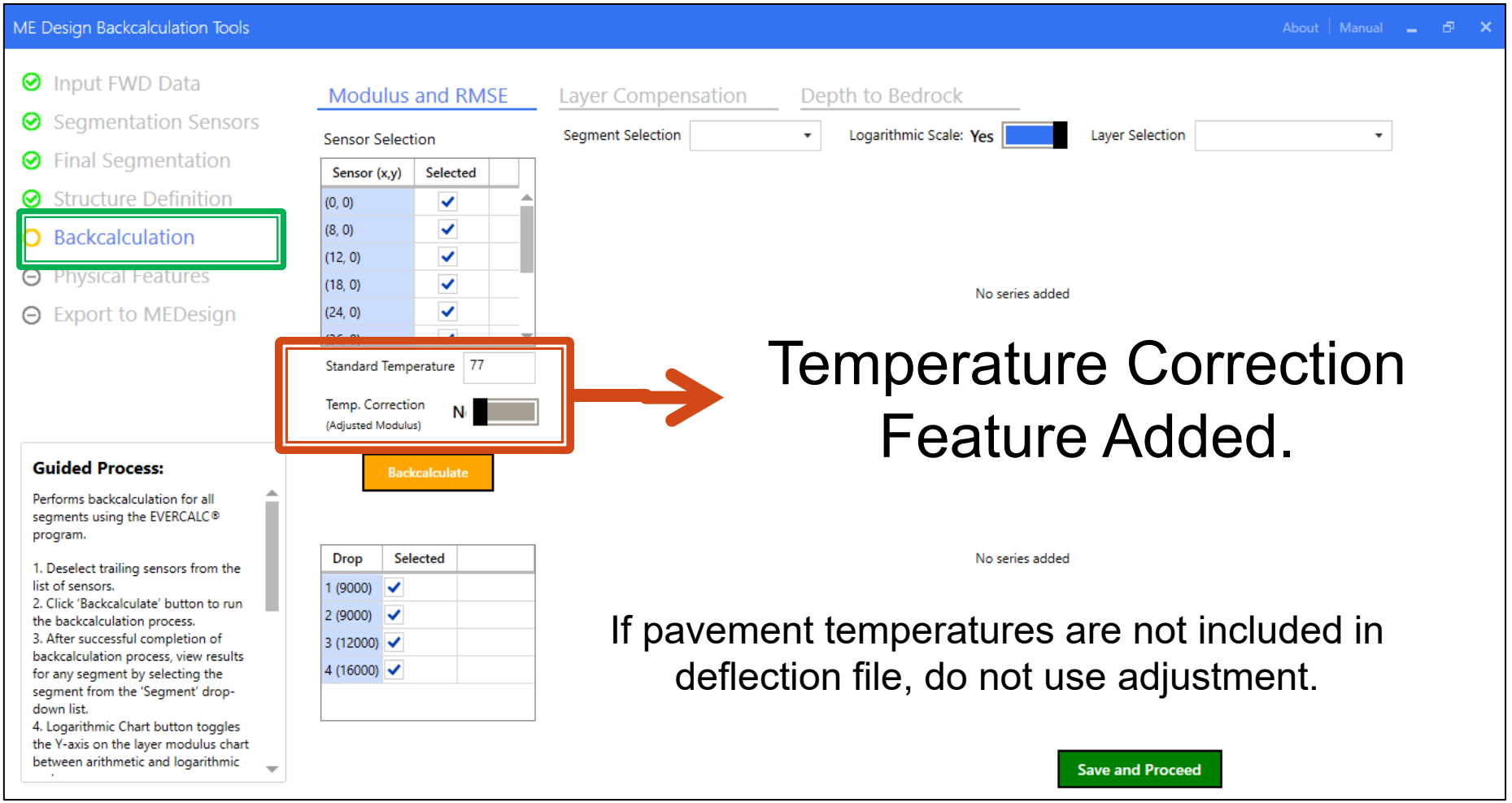
5. Backcalculation

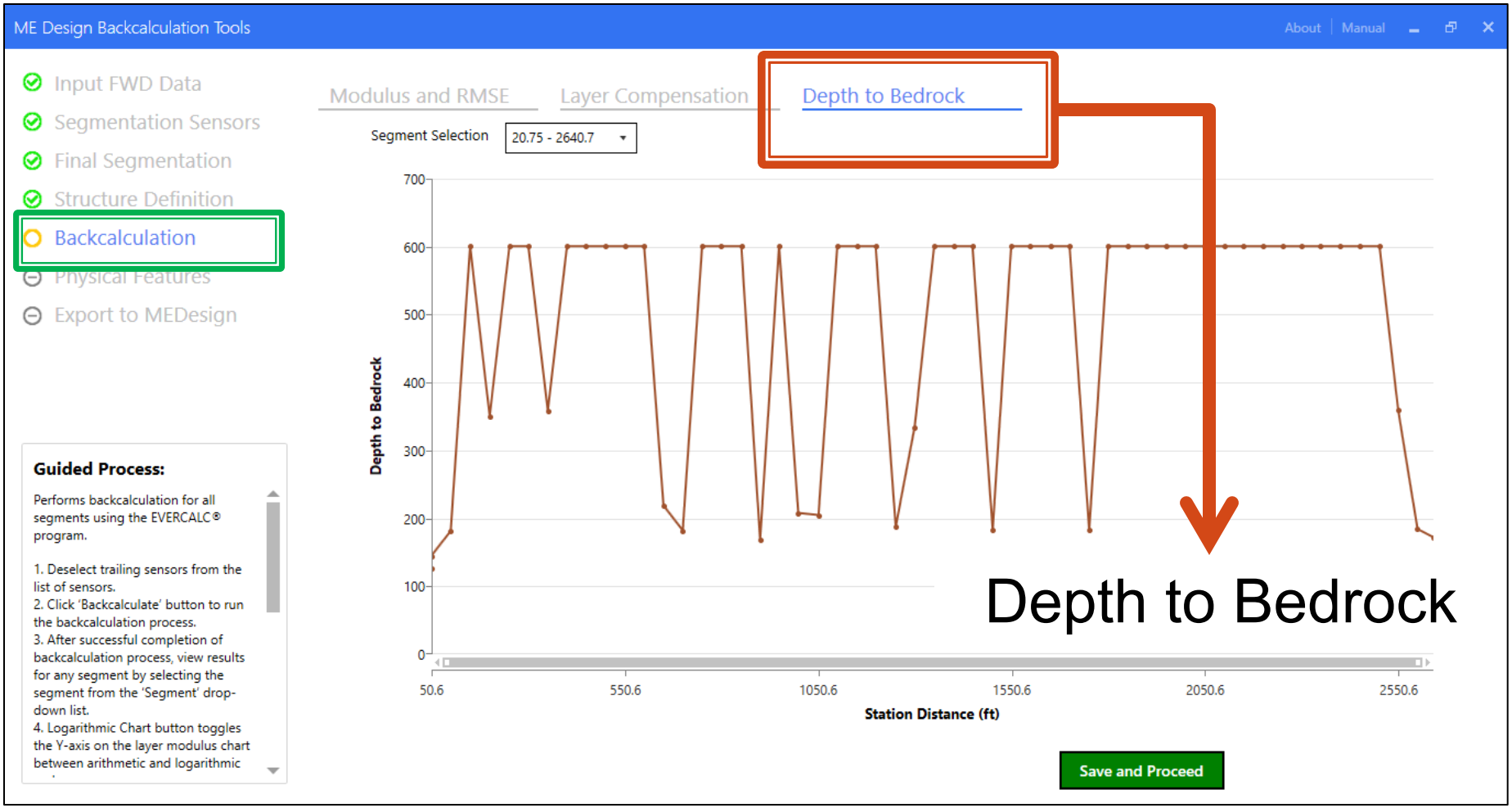


Temperature Correction Feature Added.

If pavement temperatures are not included in deflection file, do not use adjustment.

5. Backcalculation

5. Backcalculation



Demonstration of BcT Enhancements

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6. Physical FeaturesBackcalculation

Demonstration of BcT Enhancements

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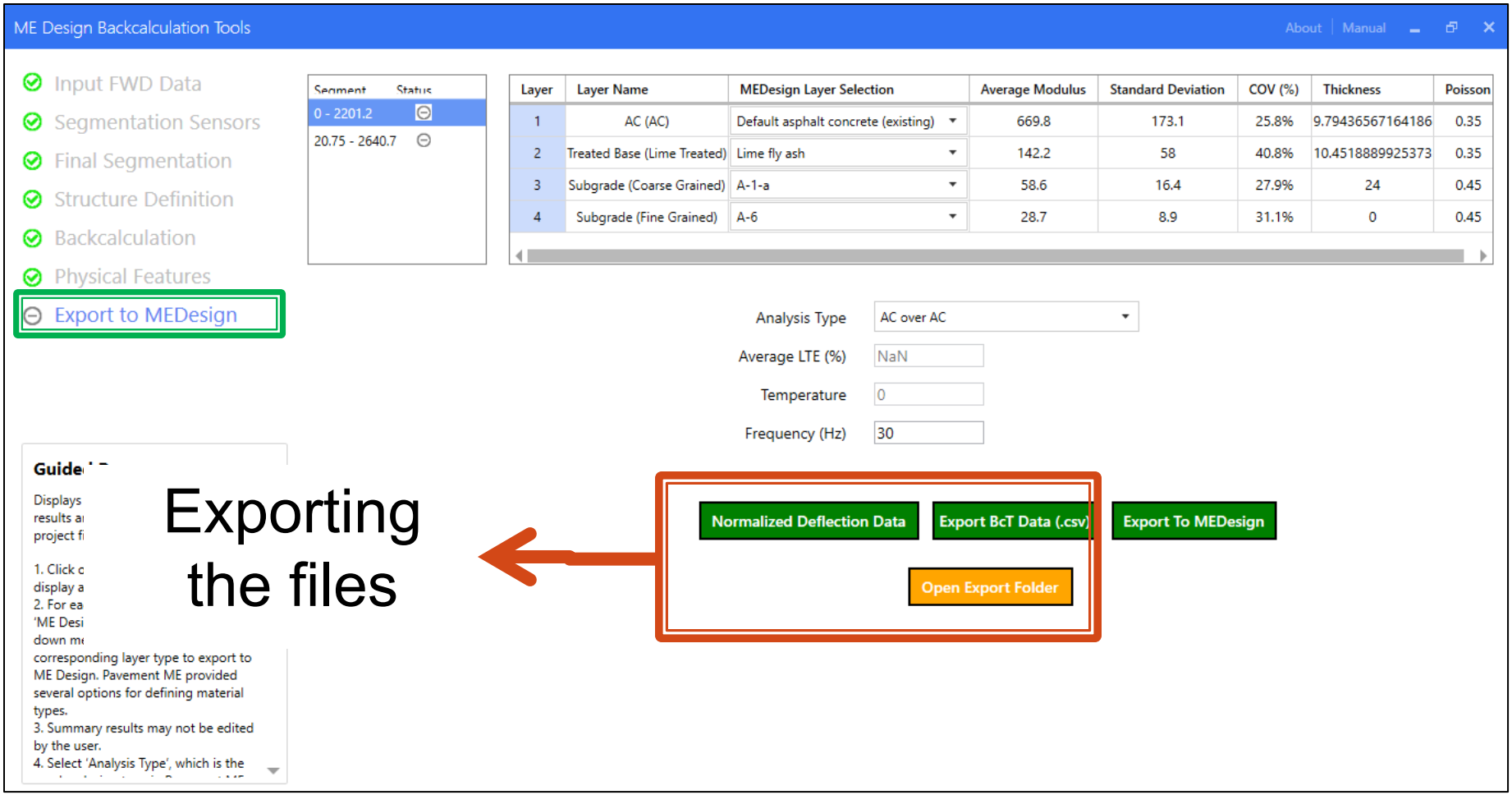
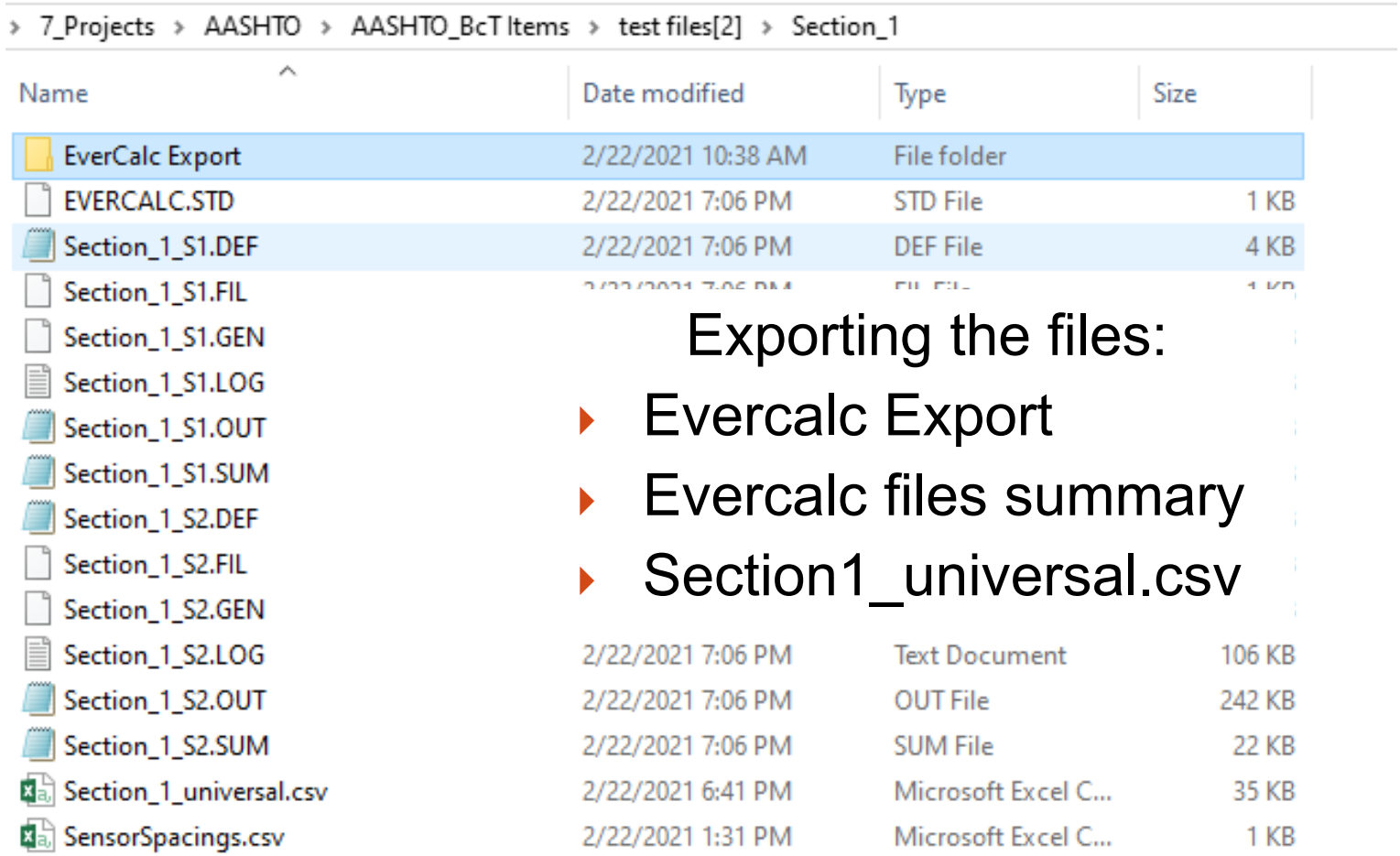
7. Export to ME Design



Exporting the files

7. Export to ME Design



Exporting the files:

- Evercalc Export
- Evercalc files summary
- Section1_universal.csv

7. Export to ME Design

A1 | Backcalculation by Evercalc 5.0 - Summary Output

	A	B	C	D	E	F	G	H	I	J
1	Backcalcu	ation by Evercalc 5.0 - Summary Output								
2	Route:									
3	Plate Radi	No of Layers: 4								
4	No of Sen	Stiff Layer: No								
5	Offsets (ir	P-Ratio: .350 .350 .450 .450								
6	Station	Load (lbf)	E1(ksi)	E2(ksi)	E3(ksi)	E4(ksi)	DepthToS	RMS Error		
7	0	9156	297.8	125.4	100	48.2	43.82	1.85		
8	0	9148	290.5	125.3	100	48.3	43.82	2.01		
9	0	12300	290.5	125.3	97.7	48.3	43.82	1.6		
10	0	15413	290.5	125.3	97.7	48.3	43.82	1.51		
11	0	9172	290.7	135	100	48.8	43.82	1.79		
12	0	9159	296.3	138	100	47.4	43.82	2.4		
13	0	12316	310	119.1	100	48.6	43.82	1.23		
14	0	16170	310	119.1	97.7	48.6	43.82	1.73		
15	50.6	9152	447.6	74.2	100	51.5	43.82	3.94		
16	50.6	9140	405.4	126.4	84.8	47.4	43.82	3.35		
17	50.6	12221	429	102.7	83.4	49.4	43.82	1.06		
18	50.6	15416	429	102.7	83.4	49.4	43.82	1.82		
19	52.3	9029	160.4	235.1	73.1	49.2	43.82	4.91		
20	52.3	9025	163.3	210.4	74.5	50.2	43.82	4.98		

Section_1_S1_evercalc

Exporting the files:
Section1_S1_evercalc.csv

BcT

PvD AASHTOWare Pavement ME Design AASHTO

FY 2021 – Webinar 3: BcT Enhancements

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Summary and Closing Thoughts

- The enhanced BcT version was based on suggestions from the users.
- Additional suggestions should be submitted to the Task Force for future enhancements and improvements.

FY 2021 Webinar #3 BcT Enhancements

Poll 2: Questions 4, 5, and 6

4. Have you used the BcT program?
   - Yes
   - No

5. Which of the following backcalculation programs do you typically use for rehabilitation design?
   - BcT
   - MODULUS
   - MODCOMP
   - EVERCALC
   - ELMOD
   - Another Program
   - Have not used a backcalculation program

6. Do you or your organization use ground penetrating radar to determine pavement layer thickness?
   - No
   - Yes

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QUESTION AND ANSWER SESSION

We welcome comments & suggestions for future webinars; Send an email to pavementmedesign@ara.com.

FY 2021 – Webinar Series

Remember:

- Webinar #4: Asphalt overlay design for pavements with multiple overlays and deflection data.
- May/June 2021.

How do we get the BcT?

1. Included in AASHTOWare PMED License

2. Standalone single user purchase

   Annual license fee: $1,250

Link to AASHTOWare Purchasing

Thank you for Attending the Webinar!

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  Phone: (202) 624-3632
- Clark Morrison, NCDOT
  cmorrison@ncdot.gov

ME Design Resource Website
http://www.me-design.com

Pavement ME Design Users Group Contact:

- Jennifer Albert, FHWA
  Jennifer.Albert@dot.gov

Help Desk, Customer Support:

PREFERRED

- Pavement ME Design Help Desk
  pavementmedesign@ara.com
- Phone: (217) 356-4500

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