AUTODESK UNIVERSITY

Don't Be a Block Head – Make It a Dynamic Experience

Tom Richardson

MWM DesignGroup - Associate | CAD Manager

Autodesk Expert Elite | @c3d_tomr

Don't Be a Block Head – Make It a Dynamic Experience

Class Summary

Why have 30 different irrigation blocks in your drawing when you only need four with visibility states?

Why are you guessing at what rotation you should place a stop sign?

Want to show a different striping arrow in two clicks?

These are just a few of the things that will be covered in this class on Dynamic Blocks. This instructional demo will cover multiple types of Dynamic Blocks using a combination of dynamic parameters. Blocks shown in the presentation will include different combinations of visibility states, rotation, stretch, attributes, alignment, and more.

Learning Objectives

OBJECTIVE 1

Learn how to use visibility states to combine multiple blocks into one.

OBJECTIVE 2

Learning how to create Dynamic Blocks that stretch and rotate.

OBJECTIVE 3

Learn how to create blocks with alignment parameters for parallel and perpendicular placement.

OBJECTIVE 4

Learn how to create blocks with move parameters to resolve overlapping symbols text.

Class Expectations

Beginner to Advanced

Mostly civil engineering-based examples to spark ideas

Instructional demo, not a hands-on lab

About the speaker

Thomas "Tom" Richardson

Tom is an Associate and a CAD Manager at MWM DesignGroup in Austin, Texas. His duties include installation / implementation of software, training, and technical support of personnel in all AEC departments. Tom is an Autodesk Expert Elite and an AutoCAD Certified Professional. Tom is also a Registered Professional Land Surveyor in Texas.

Let's Talk Dynamic Blocks
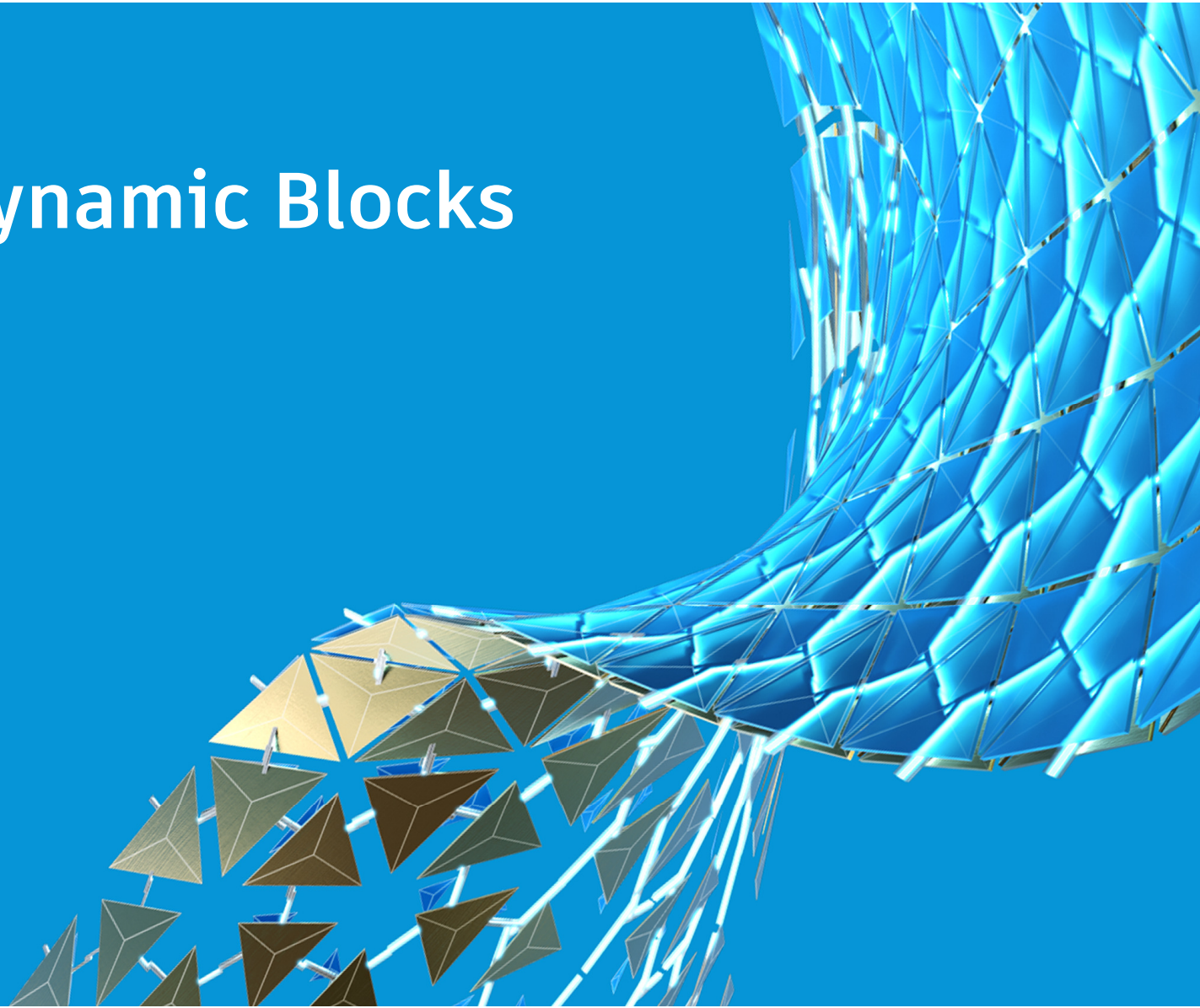
Work Smarter Not Harder

Allen F. Morgenstern, industrial engineer

creator of the work simplification program

Why Use Dynamic Blocks?

- **Better Block Library Organization**
  - Combine multiple blocks into one block to simplify the list of blocks in your drawing or library
  - Modify one block definition to affect multiple views of that block based on visibility state or other parameters
- **Make Block Placement More Efficient**
  - Use grips to rotate a block after insertion
  - Stretch or move content within a block
  - Align a block with nearby objects
  - Flip or mirror block content

Example Dynamic Blocks

- **Engineer's Seal or Notes**
- **North Arrow and Bar Scale**
- **Legend**
- **Signs**
- **Wheel Stops**
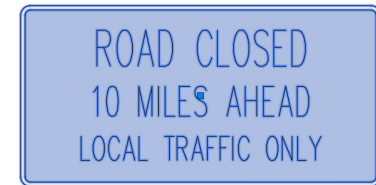- **Traffic striping**
- **Utility Blocks**
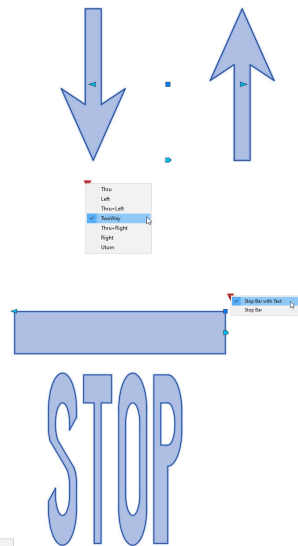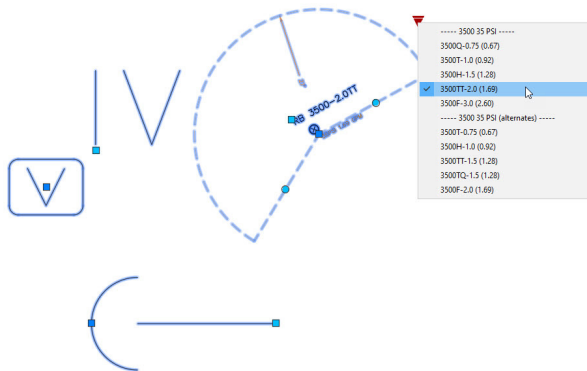
RECORD DRAWINGS

THIS RECORD DRAWING HAS BEEN PREPARED, IN PART, BASED UPON
INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS
BELIEVED TO BE RELIABLE, AAA COMPANY, INC AND ENGINEER ONE, P.E.
(STATE OF TEXAS REGISTERED ENGINEER #000001) CANNOT ASSURE ITS
ACCURACY, AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THIS
RECORD DRAWING OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE
BEEN INCORPORATED INTO IT AS A RESULT. THOSE RELYING ON THIS
RECORD DOCUMENT ARE ADVISED TO OBTAIN INDEPENDENT VERIFICATION
OF ITS ACCURACY BEFORE APPLYING IT FOR ANY PURPOSE.
NOVEMBER xx, 201x.

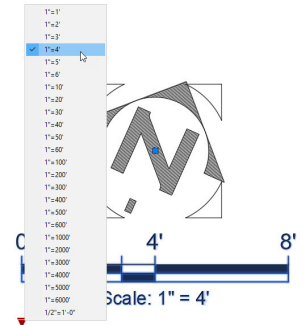|	
Engineer	✓
Irrigation	
Landscape	

EROSION

EROSION/SEDIMENTATION LEGEND

	SILT FENCE	REF: COA DET. 642S-1
—T— T—	TREE PROTECTION FENCE	REF: COA DET. 610S-1, 610S-2, 610S-3, 610S-4, 610S-5
—RB— RB—	REINFORCED ROCK BERM	REF: COA DET. 639S-1
—IP—IP—IP—IP—	INLET PROTECTION	REF: COA DET. 628S-2
—TFD— TFD—	TRIANGULAR FILTER DIKE	REF: COA DET. 628S
—MS—	MULCH SOCK	REF: COA DET. 648S-1
—FL—	FIBER LOG	REF: DET. (get from vendor)
—FS—	FILTER SOCK	REF: DET. (get from vendor)
→	FLOW ARROW	
	STABILIZED CONSTRUCTION ENTRANCE	REF: COA DET. 641S-1
REFERENCE SHEET ___ FOR EXISTING CONDITIONS LEGEND		
REFERENCE SHEET ___ FOR GENERAL LEGEND		

PICKLEGEND
SITE/GEOM
DEMO
✓ EROSION

Scale: 1" = 4'   4'   8'

1"=1'
1"=2'
1"=3'
✓ 1"=4'
1"=5'
1"=6'
1"=10'
1"=20'
1"=30'
1"=40'
1"=50'
1"=60'
1"=100'
1"=200'
1"=300'
1"=400'
1"=500'
1"=600'
1"=1000'
1"=2000'
1"=3000'
1"=4000'
1"=5000'
1"=6000'
1/2"=1'-0"

STOP

Thru
Left
Thru+Left
✓ TwoWay
Thru+Right
Right
Uturn

Stop Bar with Text
Stop Bar

ROAD CLOSED
10 MILES AHEAD
LOCAL TRAFFIC ONLY

R11-3A

Select R11 Sign	
R11-1	
R11-2	
R11-3A	✓
R11-3B	
R11-4	

RB 3500-2.0TT

----- 3500 35 PSI -----
3500Q-0.75 (0.67)
3500T-1.0 (0.92)
3500H-1.5 (1.28)
✓ 3500TT-2.0 (1.69)
3500F-3.0 (2.60)
----- 3500 35 PSI (alternates) -----
3500T-0.75 (0.67)
3500H-1.0 (0.92)
3500TT-1.5 (1.28)
3500TQ-1.5 (1.28)
3500F-2.0 (1.69)

9' spaces
8' spaces

Perpendicular
Parallel

Need to Know

1. Create the block and open block editor
2. Confirm all necessary content is in the block definition
3. Add parameters, constraints, attributes, tables, etc. and assign actions where needed
4. Assign selection sets where needed
5. Close the block editor and save
6. Place a new instance of the block and test each of the dynamic features you created

Let's Build Some Dynamic Blocks
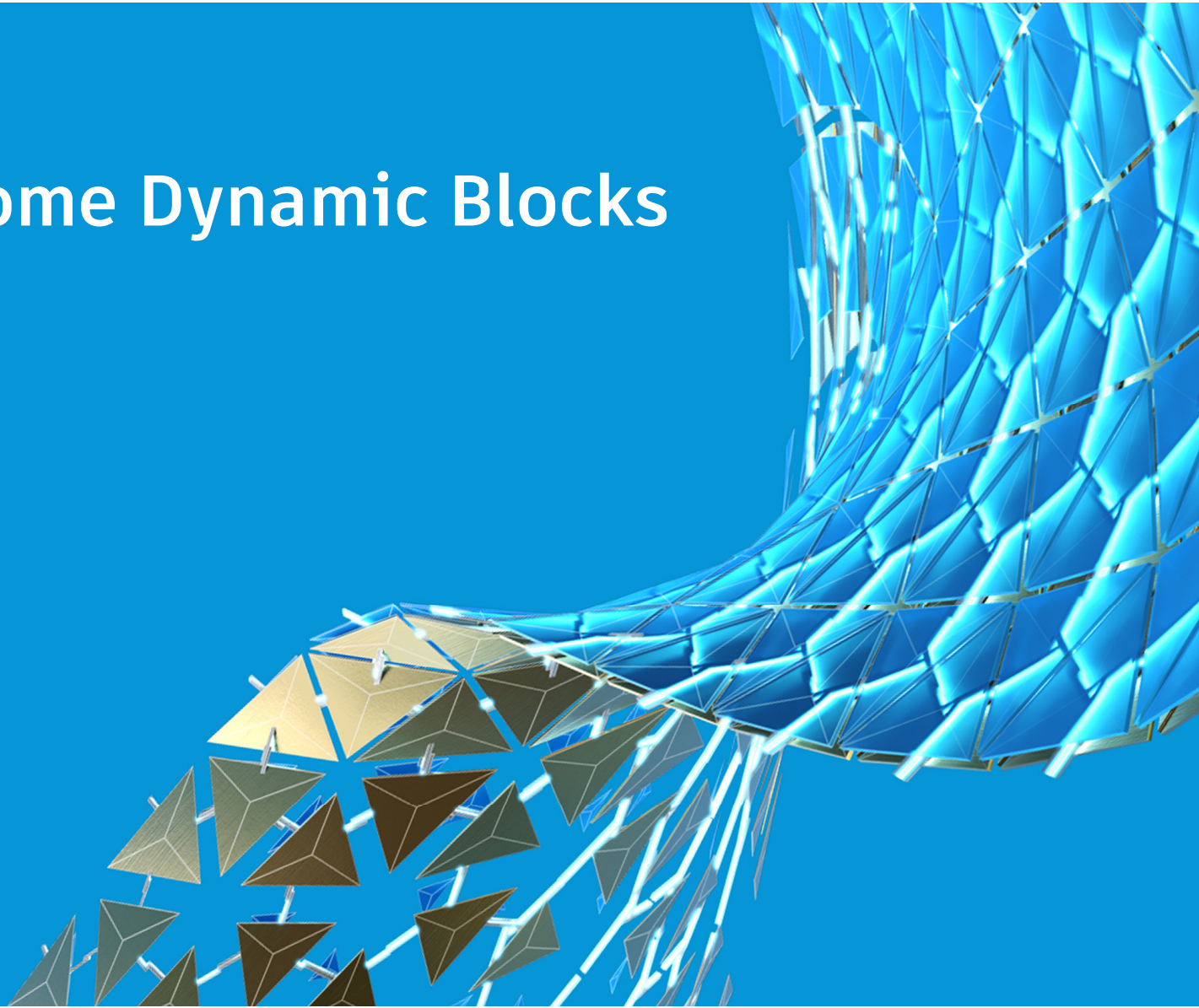
Dynamic Block Visibility States Parameter

ISSUE:

Do you have too many blocks in your block library or drawing?
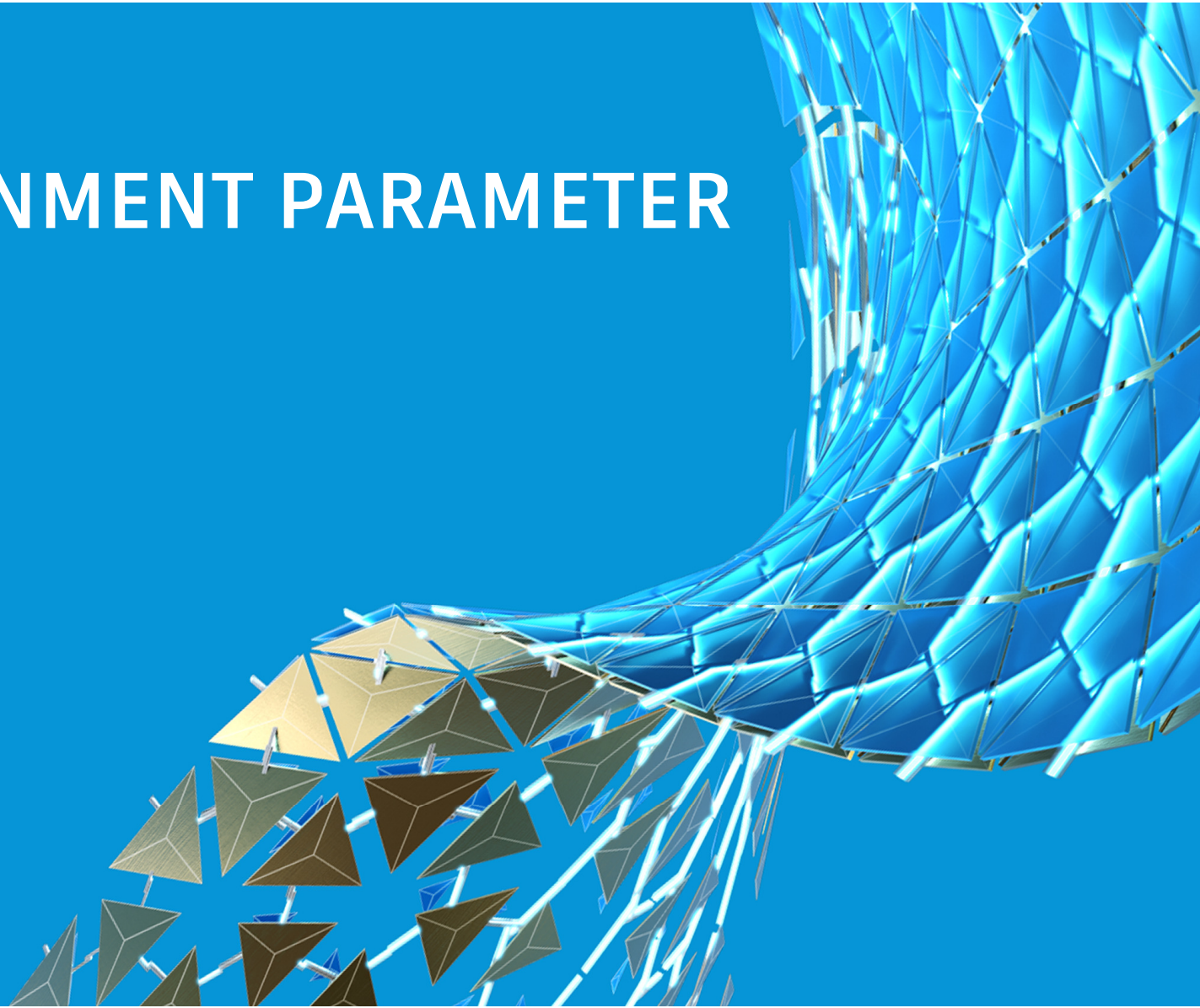
SOLUTION:

Combine multiple blocks into one block and use a visibility state to choose what's visible in the block.

DEMO:

Let's create a dynamic block with visibility states to combine multiple blocks into one block.

[RB3500]

DEMO – Visibility States

Dynamic Block Stretch and Rotate Actions

ISSUE:

Do you want to apply an action to only a portion of a block? Is rotating a block to a specific angle too complicated? How can you stretch content within a block without exploding it?

SOLUTION:

Use parameters and actions within a block to improve efficiency in block placement and apply actions to only a portion of the block content.

DEMO:

Let's create some dynamic blocks using stretch and rotate on only a portion of the block content.

[block name here]

DEMO STRETCH AND ROTATE
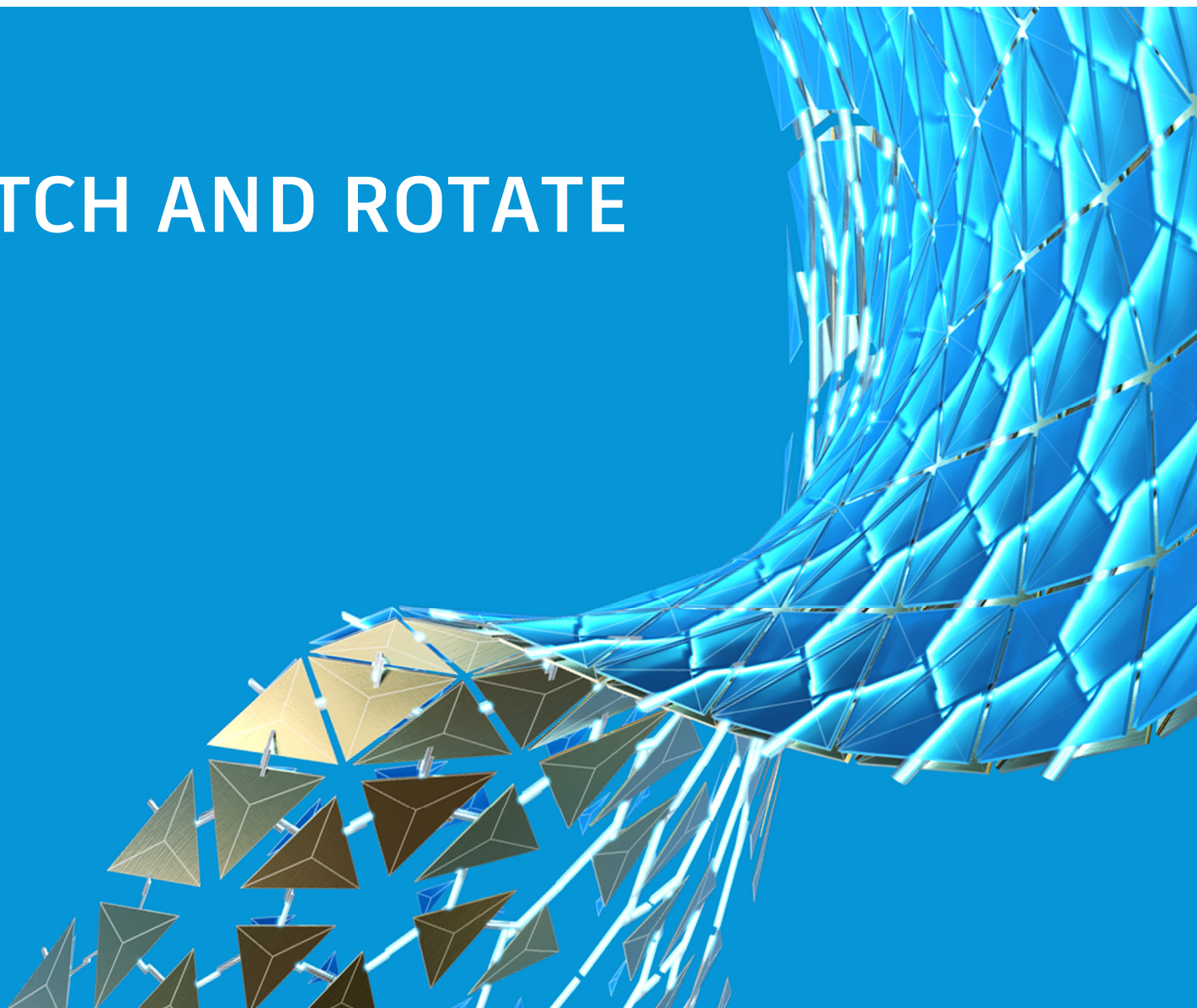
Dynamic Block Alignment Parameter

ISSUE:

What if the rotation of a block needs to be parallel sometimes and perpendicular at other times such as a sign block (one-way vs a stop sign).

SOLUTION:

Combine multiple blocks into one block and use a visibility state to choose what's visible in the block.

DEMO:

Let's create a sign block with visibility states for parallel and perpendicular then add an alignment parameter

[block name here]

DEMO ALIGNMENT PARAMETER

Dynamic Block Move Action

ISSUE:

Do you have overlapping text in your drawing? Is some of that text inside of a block?

SOLUTION:

Add a Point Move parameter set and move any overlapping text away from other conflicts

DEMO:

Let's create a dynamic block with a Point Move parameter applied to text in the block then test how it works to resolve overlapping text content in drawings that contain blocks with text.

[block name here]

DEMO MOVE ACTION
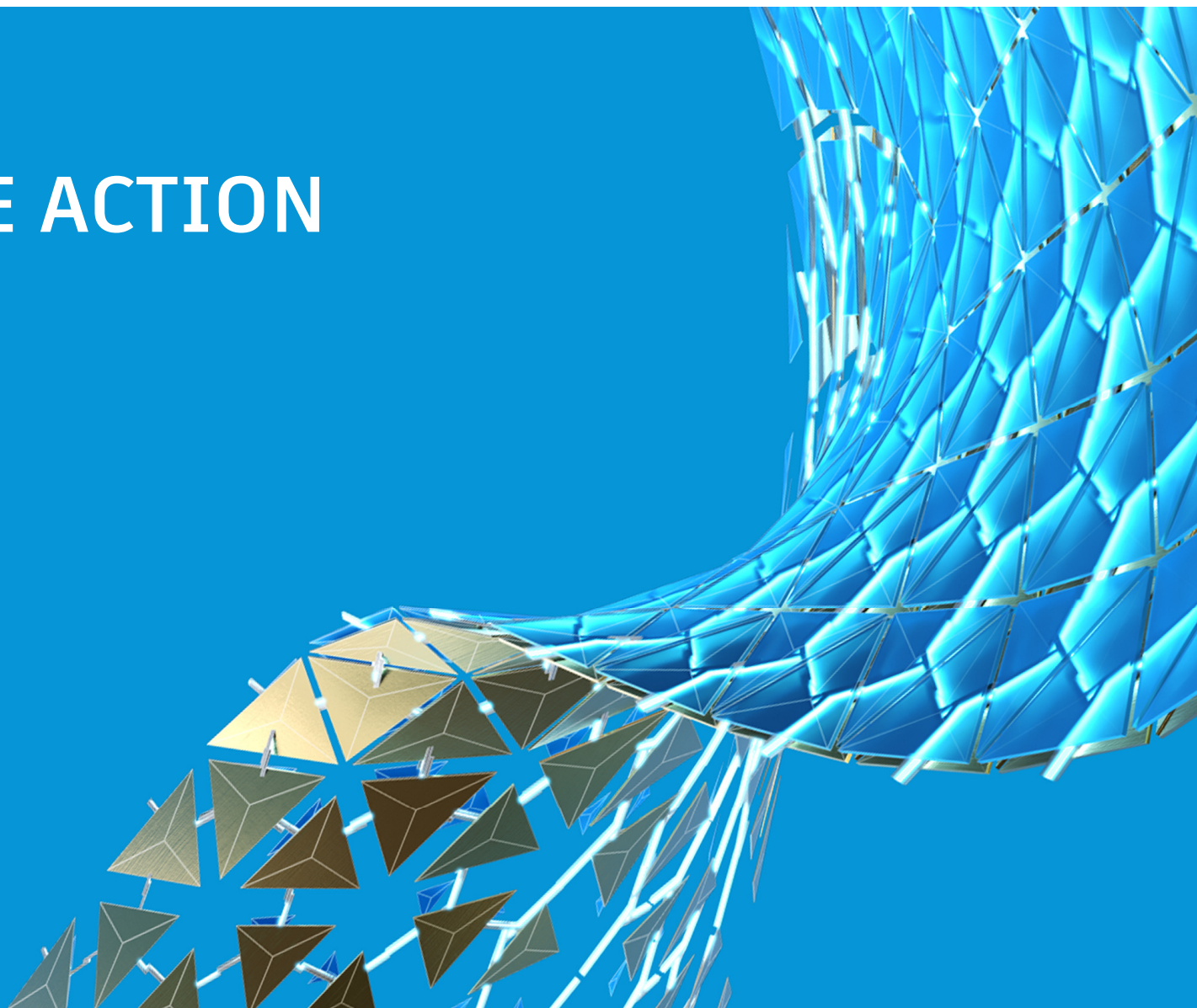
Bonus Content

IRRIGATION BLOCK

The irrigation block we created has visibility states established, but still needs point move rotation parameters applied.

STOP BAR

The stop bar we created can have the word STOP added to a visibility state.
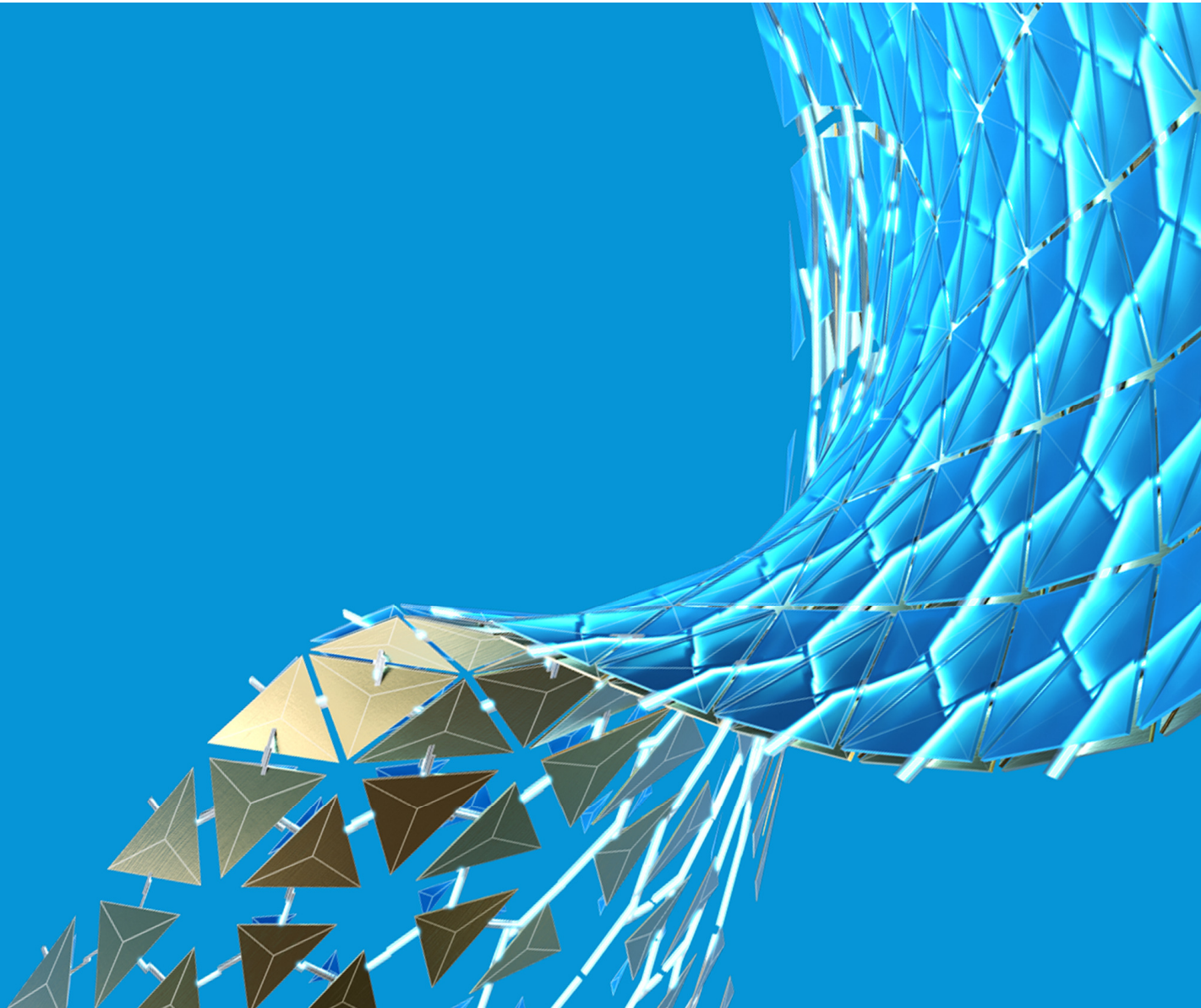
DOWN GUY WIRE

How about a down guy wire that will stretch and rotate at the same time (requires polar stretch instead of rotate and stretch).

PAVEMENT ARROW BLOCK

What about a pavement arrow block that includes all arrow types (visibility states), an alignment parameter and stretch capabilities.

DEMO

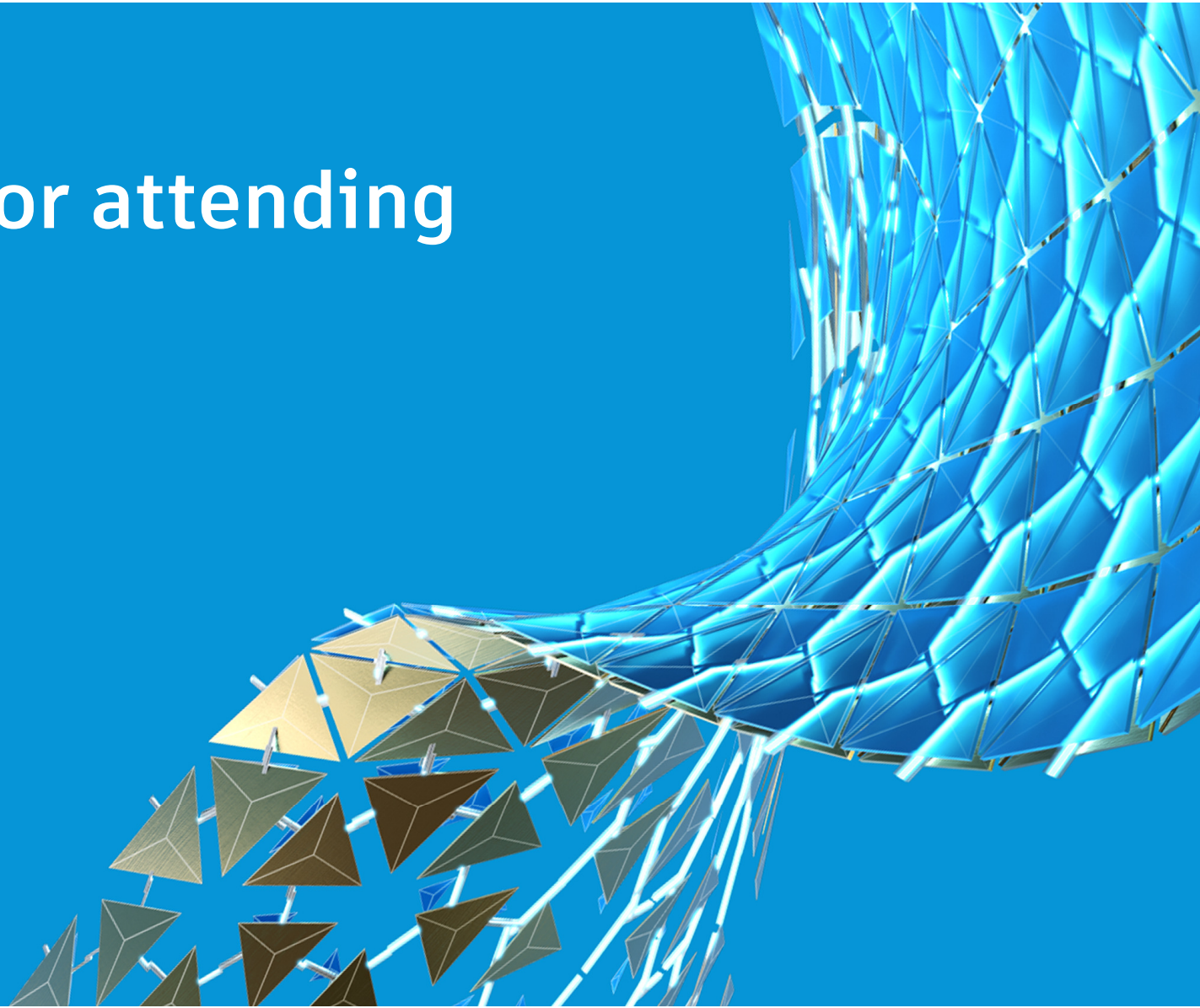# Don't Be a Block Head – Make It a Dynamic Experience

In Summary

Dynamic blocks can improve the way your plans look and can help you be more efficient with your process of utilizing blocks. Expand the possibilities by combining parameters such as visibility states and alignment or rotation parameters. Autodesk provides some interesting blocks in the default tool palette. Make sure you review these to see additional ways to utilize dynamic block parameter.

Q&A

Look for the Q&A schedule the week of Autodesk University (11/16/2020-11/20/2020)

Thank you for attending

AUTODESK