Outside Leak Investigation

Storyboard <u>FINAL</u> V1.4

08-17-2023

Document History

Version #	Date	Written/Revised By	Description
Draft V0.1	2023-04-28	Eric M. Scharf Solution Design Architect	• Initial Storyboard Draft
Draft V0.2	2023-05-05	Eric M. Scharf Solution Design Architect	• Updated for Final Review
Draft V0.3	2023-05-11	Eric M. Scharf Solution Design Architect	• Tool Set Options Updated • Scenario 5 Details Updated • Leak Survey Details Added
Final V1.0	2023-05-17	Eric M. Scharf Solution Design Architect	• Added Detection Clarifications • Added Help Screen Clarifications • Finalized Per Client Approval
Final V1.1 *(Post-Approval Change)*	2023-06-26	Eric M. Scharf Solution Design Architect	• Scenario 5 Details Updated
Final V1.2 *(Post-Approval Change)*	2023-07-07	Eric M. Scharf Solution Design Architect	• Help Screen Updated
Final V1.3 *(Post-Approval Change)*	2023-07-20	Eric M. Scharf Solution Design Architect	• Gas Measure Ranges Updated • Confirmation Outlines Updated • Tools Menu Guidance Updated • Help Screen Updated • Scenario Variables Identified
Final V1.4 *(Post-Approval Change)*	2023-08-17	Eric M. Scharf Solution Design Architect	• Map Tool Set Option Updated

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DISCLAIMER: This document – like all storyboards across feature film, episodic broadcast television, interactive software, and other similar media – demonstrates (1) a ***visual approximation*** and (2) an accurate feature set for development of the agreed upon "Outside Leak Investigation" end product. The first of six total scenarios will demonstrate the complete outside leak process. The remaining five scenarios receive a narrower visual treatment to avoid repetitive steps.

Please NOTE: This document has been created for both the client and offshore outsource development resources. This document contains no proprietary information.

ENDEAVR Screen

Functionality

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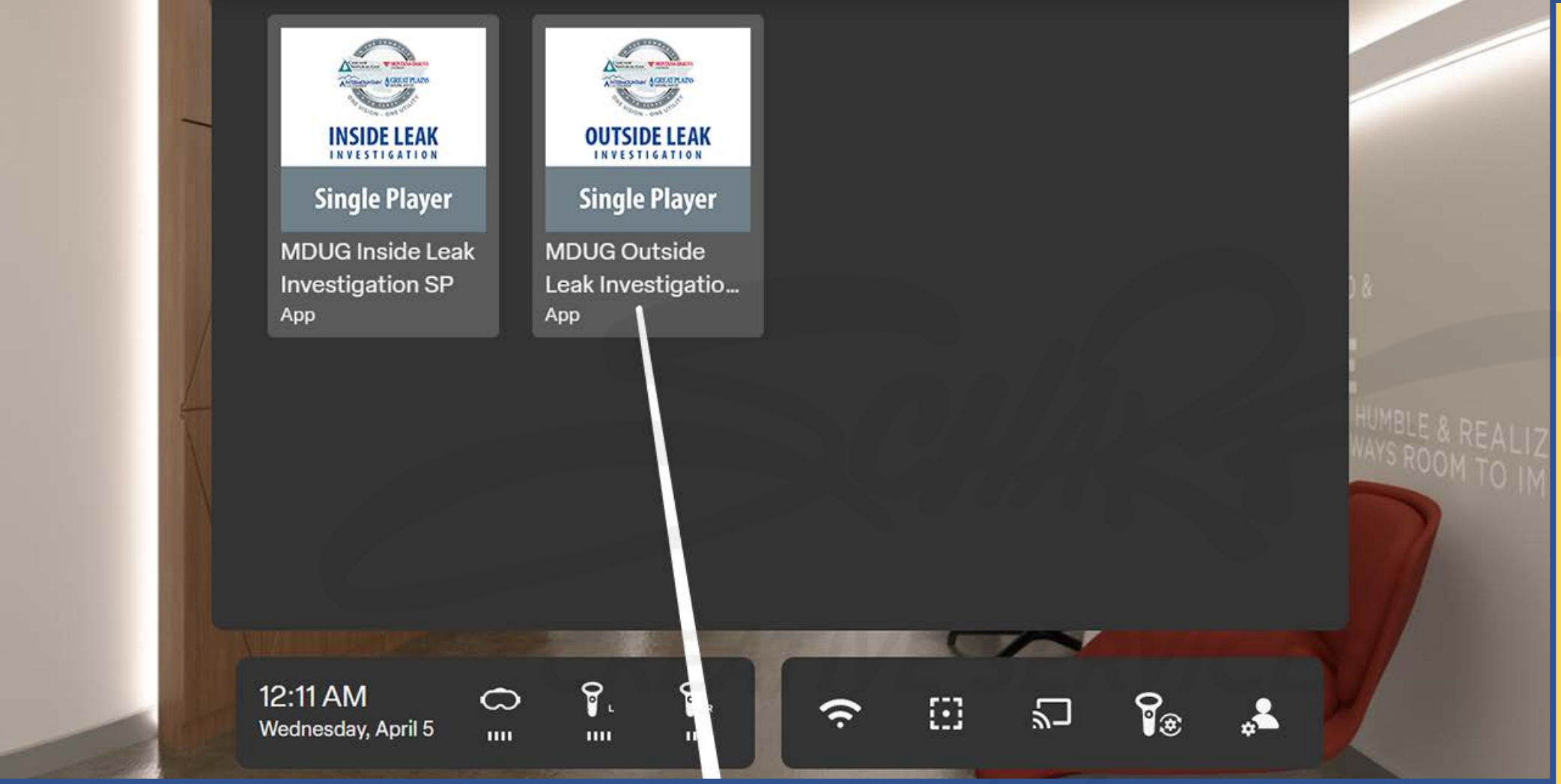

***DESCRIPTION**: Once the user powers on their Pico Neo 3 Pro VR headset, puts their headset on, and (soon thereafter) sets/confirms their virtual boundary, they will be greeted with the above application screen (or "virtual lobby"). The user taps the "LEAK INVESTIGATION Single Player" icon with either hand controller to launch that application.*

***DEVELOPERS**:*

Carefully read the description.

Login Screen

Functionality

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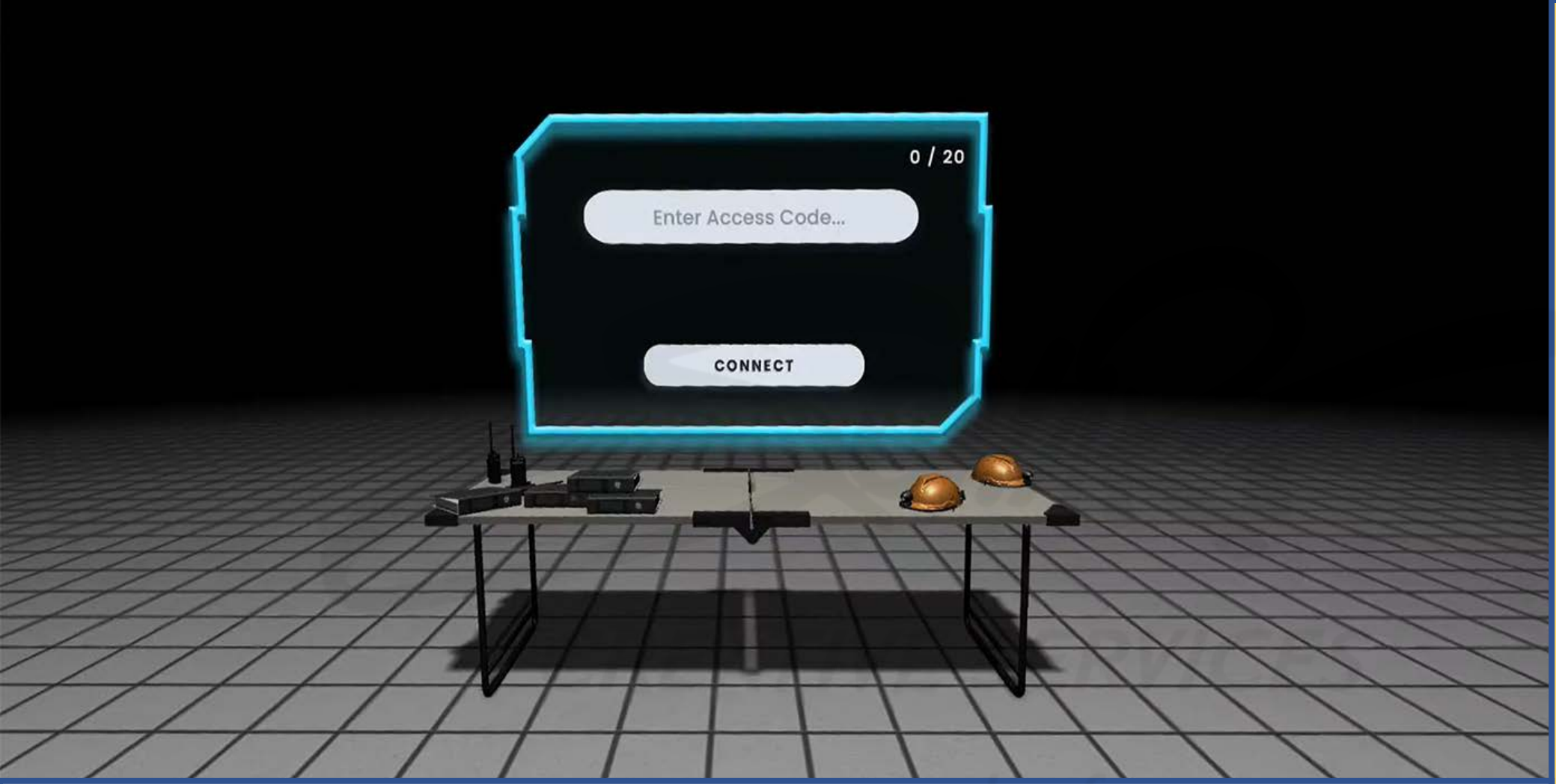
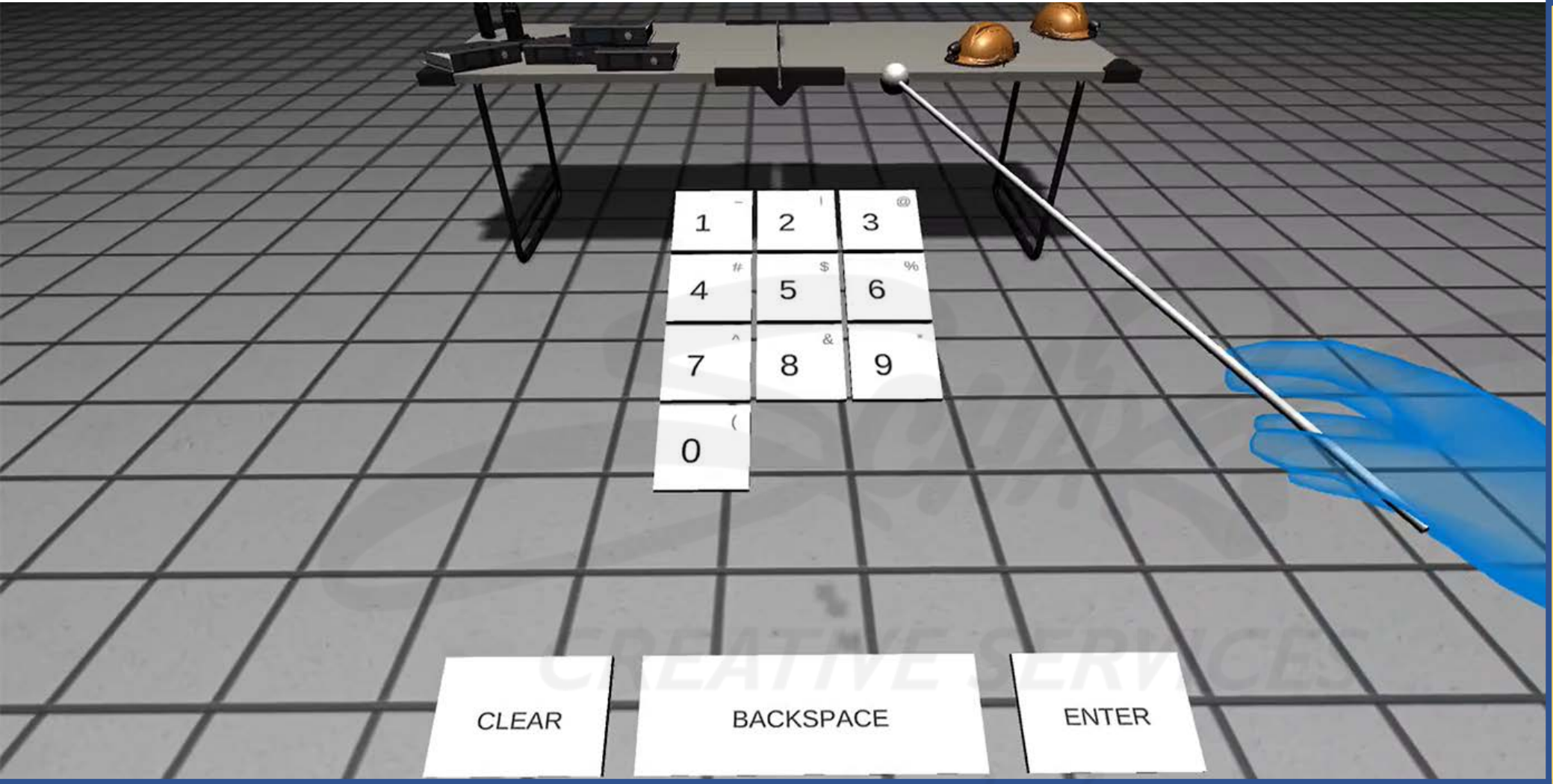


***DESCRIPTION**: Upon tapping the "LEAK INVESTIGATION Single Player" icon within the virtual lobby, the application displays the above ACCESS CODE screen. The user aims either hand controller at the ENTER ACCESS CODE field and the controller trigger button to activate that field.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

There are NO changes to the APK login screen. It should function just like it does for "Inside Leak Investigation."

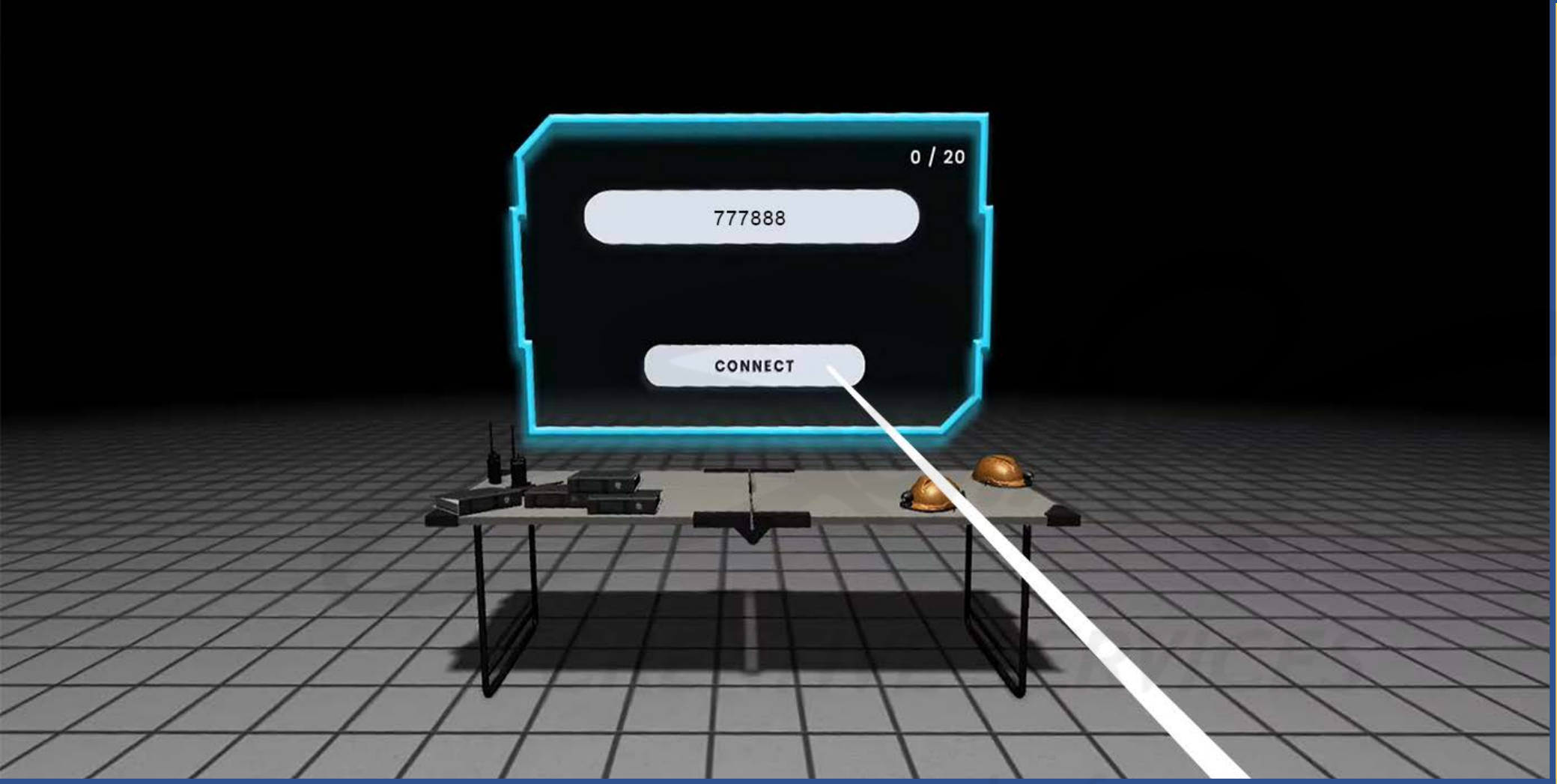


***DESCRIPTION**: Upon activating the ACCESS CODE field, the application responds to the user by displaying (1) a keypad of numbered buttons, (2) a CLEAR button, (3) a BACKSPACE button, and (4) an ENTER button. The user taps their (correct) ACCESS CODE into the ACCESS CODE field (using the virtual xylophone) as shown above and taps the ENTER button.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

There are NO changes to the APK login screen. It should function just like it does for "Inside Leak Investigation."



***DESCRIPTION**: The user taps the CONNECT button.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

There are NO changes to the APK login screen. It should function just like it does for "Inside Leak Investigation."

***DESCRIPTION**: Upon the user tapping the CONNECT button (and assuming the ACCESS CODE has been entered correctly), the user is greeted with a confirmation screen (asking them to confirm their name – typically only their FIRST name – is being displayed correctly. The user taps YES.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

There are NO changes to the APK login screen. It should function just like it does for "Inside Leak Investigation."

***DESCRIPTION**: The user is transported from the LOGIN SCREEN to a residential neighborhood environment where the "Outside Leak Investigation" experience takes place. The neighborhood involves one "NO OUTLET" street with TEN homes, only SIX of which will be available to the user for EXTERIOR leak investigation activities. Each of those SIX homes will be associated with unique scenarios, with a given scenario being assignable by a client training facilitator within the ENDEAVR XR Management Platform (herein referred to as ENDEAVR).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

Tools Menu

Functionality

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***DESCRIPTION**: The user briefly surveys the larger neighborhood environment before reaching to activate the TOOLS MENU on their smartwatch on their left controller. The user will utilize the Y button on their left controller to activate the TOOLS MENU on the smartwatch.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

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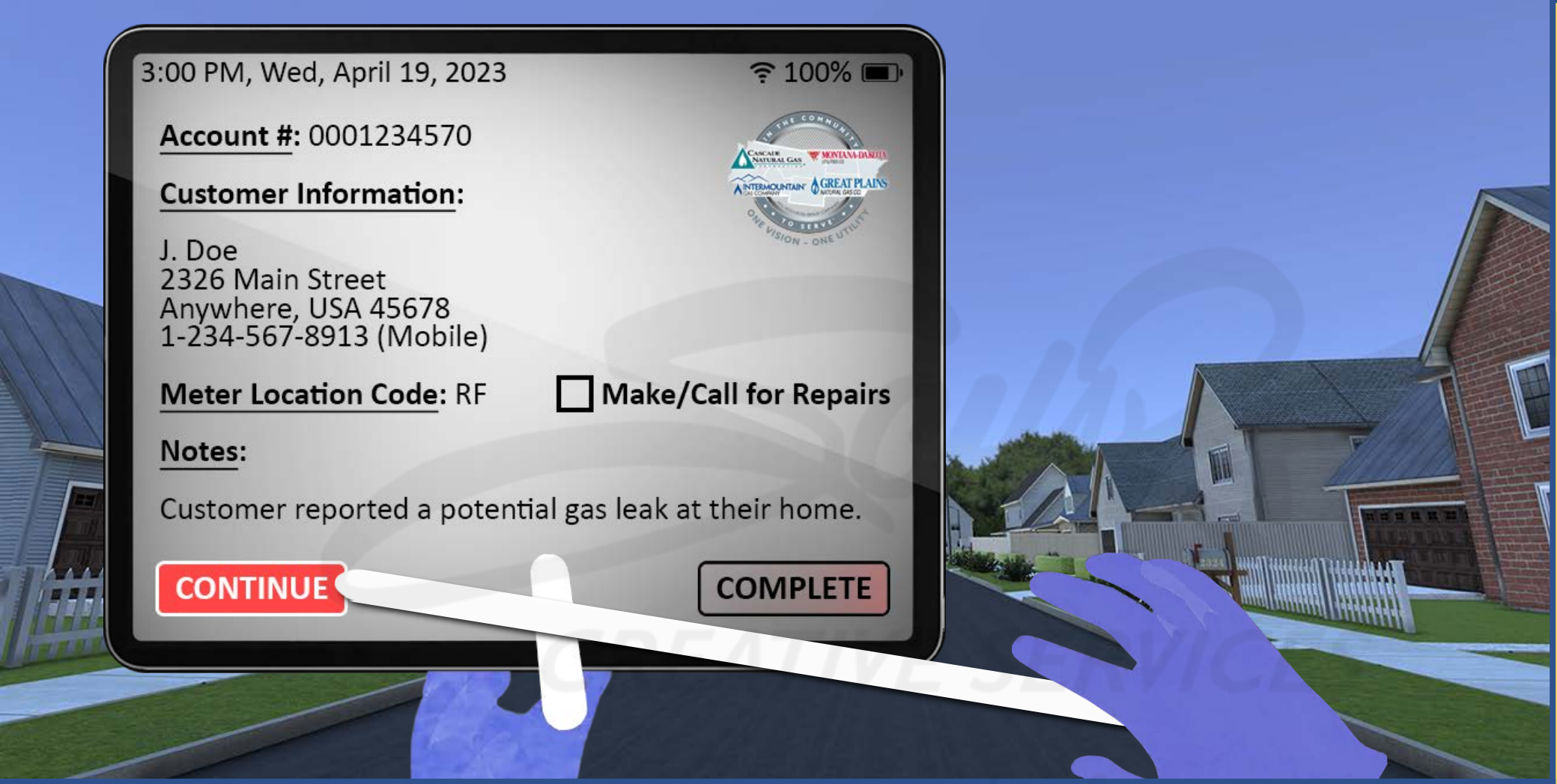
***DEVELOPERS**:*

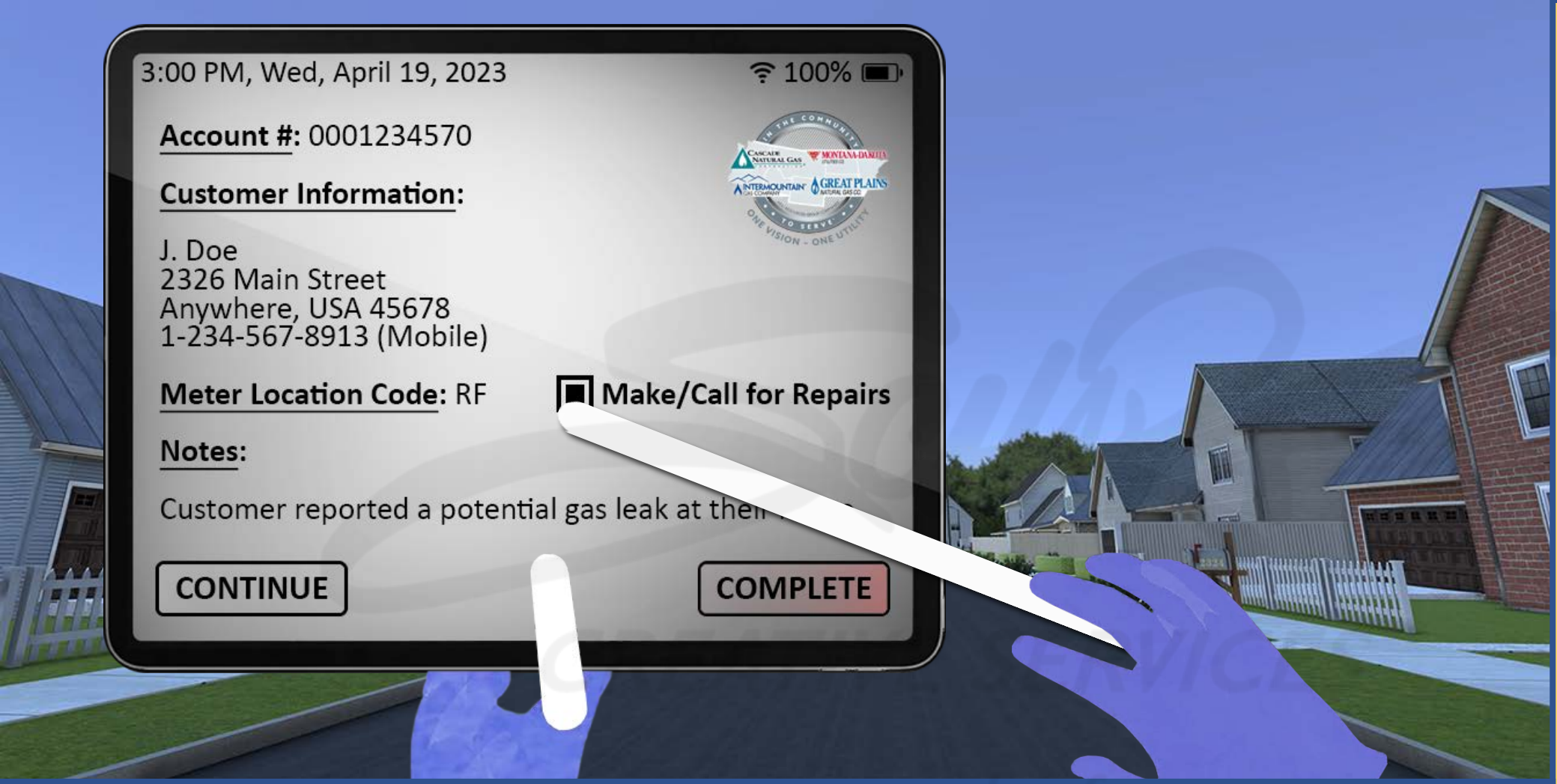
Carefully read the description and review the visual aids.



***DESCRIPTION**: The user will manipulate the laser on their right controller to tap the CONTINUE button on the WORK ORDER (which closes the WORK ORDER and allows the user to continue with a given scenario). The user CAN press the COMPLETE button at any time. It is up to the user – as with "Inside Leak Investigation" – to pay attention and not prematurely select the COMPLETE button (or check the box next to MAKE/CALL FOR REPAIRS) until they believe they have, indeed, successfully completed a given scenario.*

***DEVELOPERS**:*

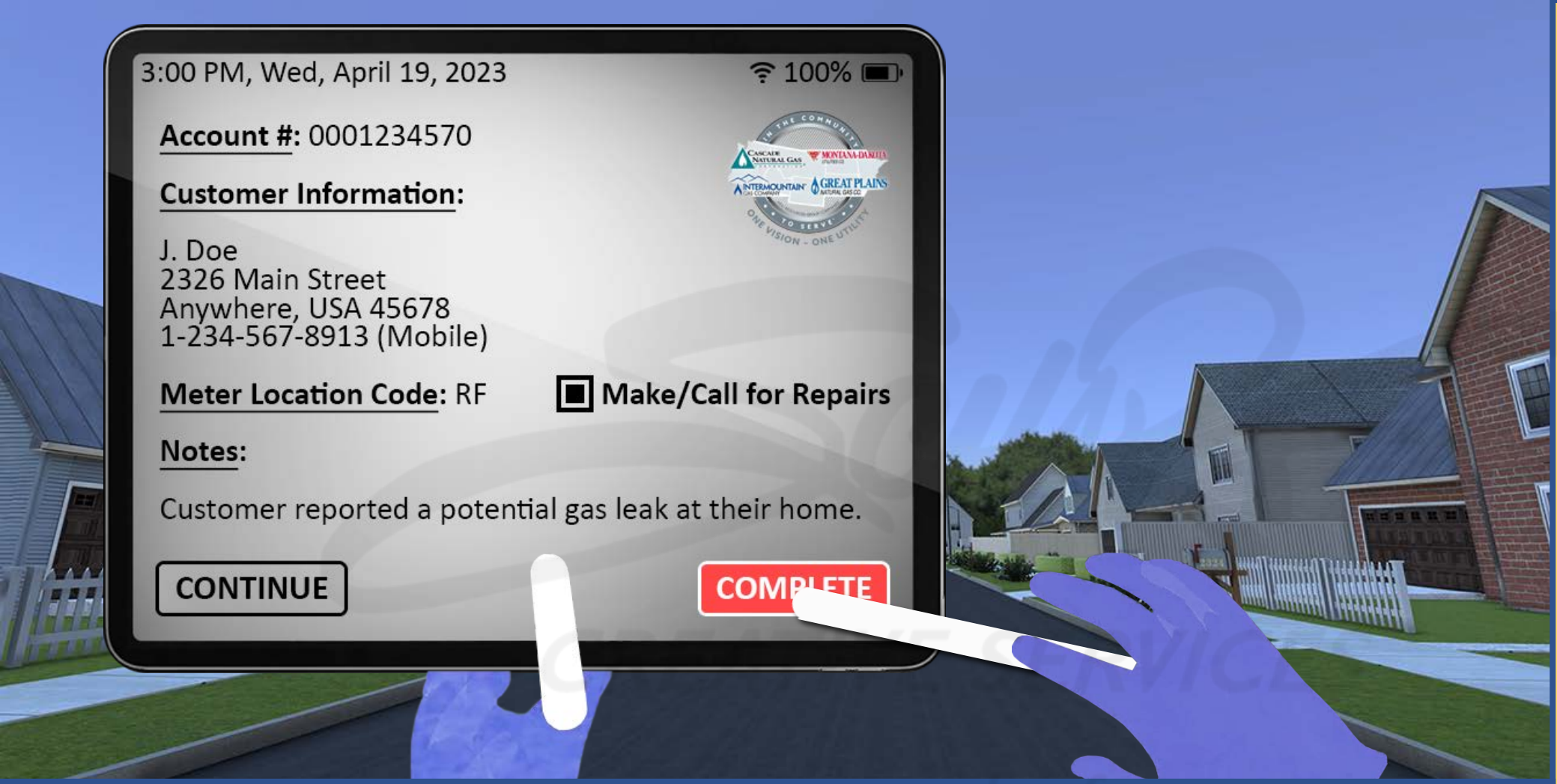
Carefully read the description and review the visual aids.



***DESCRIPTION**: The MAKE/CALL FOR REPAIRS check box is a new, trackable data point. If a successfully located leak is severe enough to require repairs, the user – by real-world protocol – should CHOOSE to check that box prior to selecting the COMPLETE button. If – for whatever reason – the user does not choose to select the MAKE/CALL FOR REPAIRS check box, that inaction should merely be reflected within the ENDEAVR user reporting.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user will manipulate the laser on their right controller to tap the COMPLETE button on the WORK ORDER (which concludes a given scenario and closes the simulation).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

a. Combustible gas: Methane, audio and visual alarm indicators from 5% LEL to 100% LEL.

   i. Green LED/Ready = 0% - 4.9% LEL Methane
   ii. Amber LED/Low = 5% - 9.9% LEL Methane
   iii. Red LED/Haz1 = 10.0% - 24.9% LEL Methane
   iv. Red LED/Haz2 = 25.0% - 49.9% LEL Methane
   v. Red Flashing LED/Haz3
      METHANE: 50% LEL Methane to 17% volume* Methane
      (LED indicator only above 17% volume Methane)
      PROPANE: 50% LEL Propane to 12% volume* Propane
      (LED indicator only above 12% volume Propane)
   *When equipped with percent volume sensor.

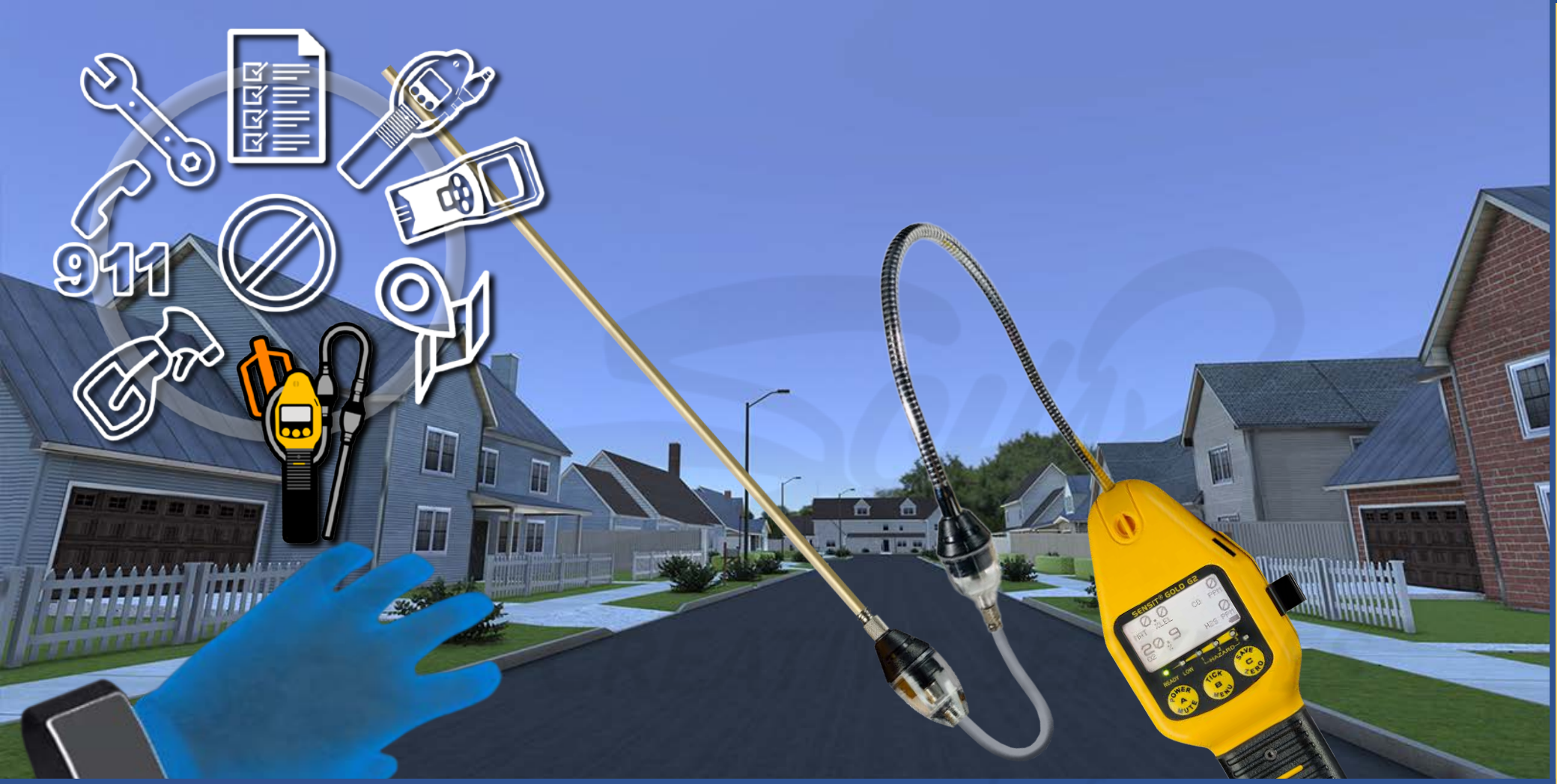
b. Oxygen - below 19.5% and above 23.5%
c. Carbon Monoxide - 35ppm per utility industry standards
d. Hydrogen Sulfide - 10ppm and above per Federal OSHA guidelines
e. Hydrogen Cyanide - 5ppm and above

***DESCRIPTION**: The above-left chart – from "Inside Leak Investigation" – describes alarm ranges for LEL gas readings for the SENSIT CGI (or "SNIFFER"). The above configurations are to remain unchanged within "Outside Leak Investigation." The SENSIT CGI was scaled up in size by 35% for "Inside Leak Investigation," and it must remain the size for this project. **PLEASE NOTE**: The gas readings detected by the SENSIT CGI are required to gradually ramp up from 0.0% or ramp down to 0.0% within the device's user interface screen (depending upon the user's distance to or from a given gas leak source).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***PLEASE NOTE**: The gas readings detected by the SENSIT CGI are required to gradually ramp up from 0.0% or ramp down to 0.0% within the device's user interface screen (depending upon the user's distance to or from a given gas leak source).*



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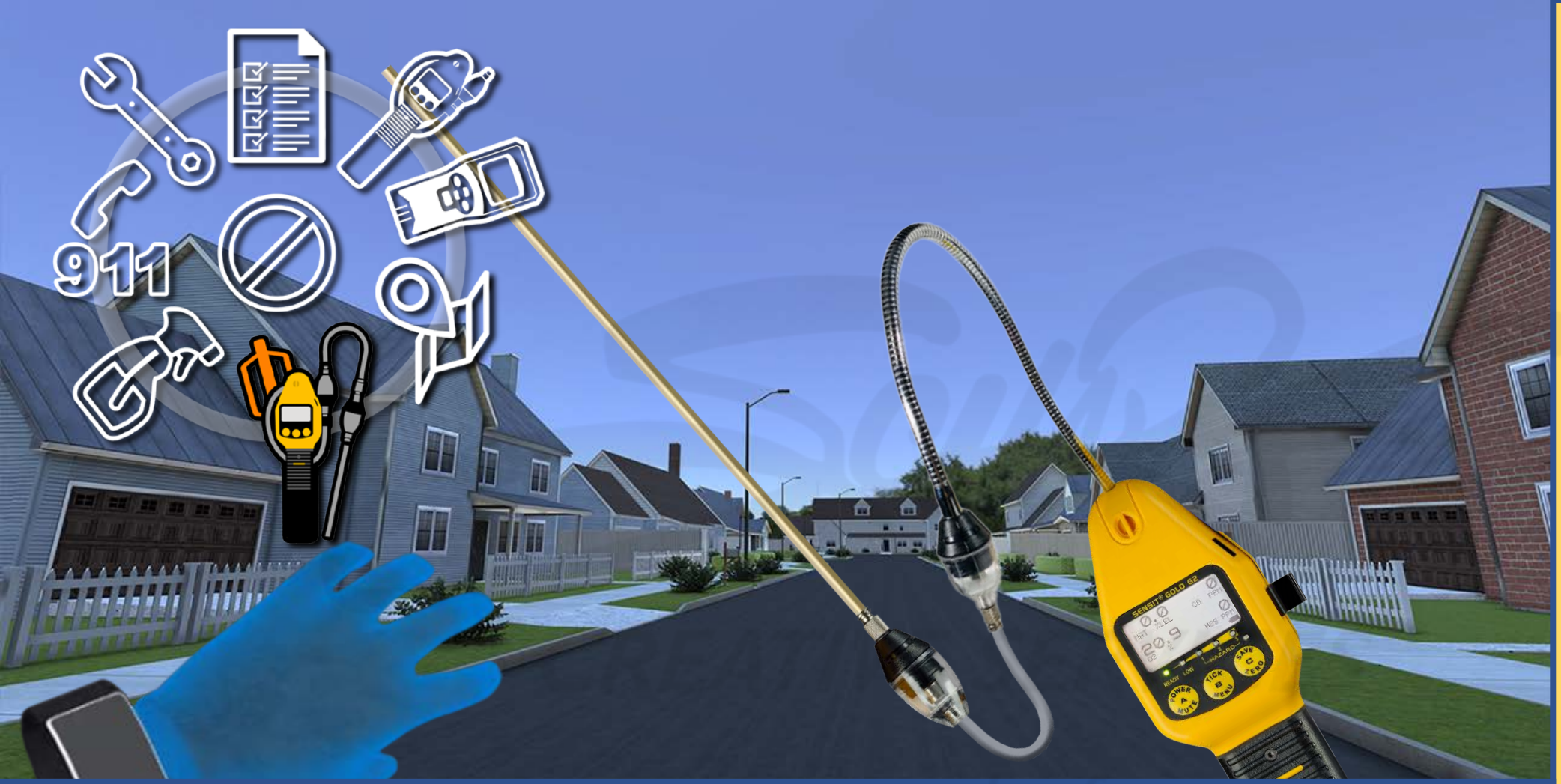
***DEVELOPERS**:*

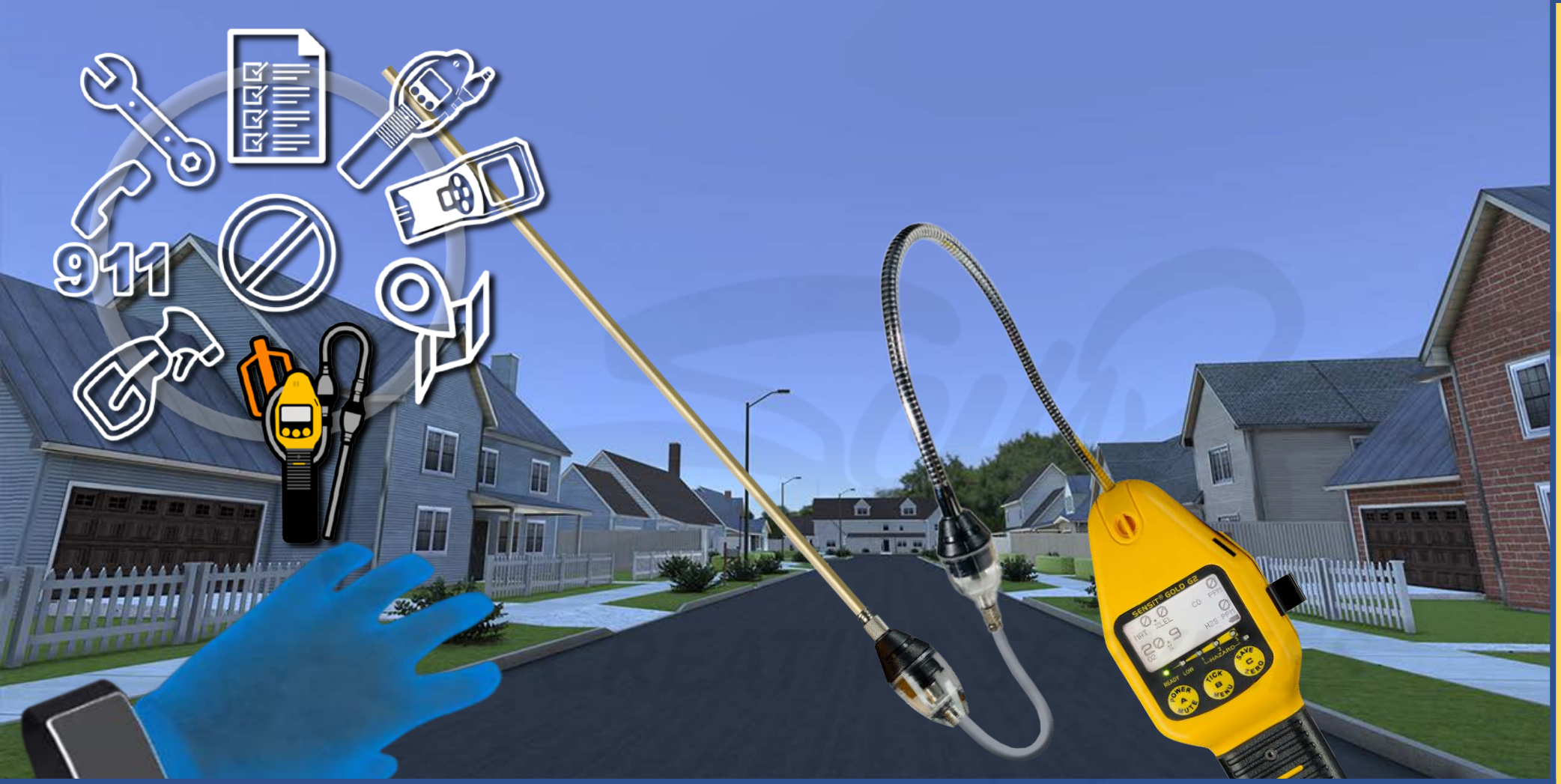
Carefully read the description and review the visual aids.



***DESCRIPTION**: The icon for the SENSIT CGI WITH BAR HOLE ATTACHMENT resembles a combination of the SENSIT CGI WITH BAR HOLE ATTACHMENT and the BAR HOLE PROBE. When the SENSIT CGI WITH BAR HOLE ATTACHMENT is selected, the user can aim their left controller laser (and pull the forefinger trigger of that controller) at any spot within organic navigable surfaces. Upon doing so, the animation for the BAR HOLE PROBE and the animation for the SENSIT CGI WITH BAR HOLE ATTACHMENT must play consecutively, one time for each, one after the other, with NO DELAY between animations.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: While the animations for the BAR HOLE PROBE and SENSIT CGI WITH BAR HOLE ATTACHMENT are playing (one after the other, with NO DELAY between them), the SENSIT CGI WITH BAR HOLE ATTACHMENT will be the ONLY device displayed within the user's right controller during this process. The device's "03, 02, 01" (3-second) countdown and gas measurement functionality will begin as soon as the BAR HOLE PROBE animation concludes. The BAR HOLE PROBE will NEVER be held by the user. The BAR HOLE PROBE will ONLY appear as part of the animation sequence.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

BAR HOLE Gas Reading Measurements

Alarm range for gas %
(VOLUME rather than LEL)
(LEL x .05 = VOLUME)

GREEN LED/Ready = 0.0% - 0.245%

AMBER LED/Low = 0.25% – 0.495%

RED LED/Hazard1 = 0.50% – 1.245%

RED LED/Hazard2 = 1.25% – 2.495%

RED Flashing LED/Hazard3 = 2.5% and above

***DESCRIPTION**: The above-left chart describes alarm ranges for VOLUME gas readings which are displayed whenever the user is specifically manipulating the SENSIT CGI WITH BAR HOLE ATTACHMENT (e.g., 1.3% GAS = approximately 27% LEL). An example of the BAR HOLE MODE user interface screen is shown above-right. "RUN 03 SEC" is a countdown from 03 seconds down to 00 (ZERO) seconds. "ON" is the current reading. "PK" is peak (or the highest reading found during the countdown). The ON and PK readings may differ at the end of each BAR HOLE reading countdown.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***PLEASE NOTE**: The decimal-based percentages displayed within the "BAR HOLE Gas Reading Measurements" chart (on the left) are SPECIFIC to the behavior of the ALERT lights (READY, LOW, HAZARD 1, HAZARD 2, HAZARD 3) on the UI screen of the SENSIT CGI WITH BAR HOLE PROBE ATTACHMENT.*

***DESCRIPTION**: Once a gas reading has been acquired, a yellow flag should appear in that hole displaying the highest reading (captured during the "03, 02, 01" countdown) on the face of that flag. Once the yellow flag is in place, the user will be unable to perform another reading for that hole. PLEASE NOTE: The gas readings detected by the SENSIT CGI WITH BAR HOLE ATTACHMENT are required to gradually-yet-quickly ramp up from 00% within that "03, 02, 01" countdown. The gas readings should appear as WHOLE NUMBERS, not with decimal points.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***PLEASE NOTE**: The WHOLE NUMBER percentages within the UI screen (as shown on the left) are based upon three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). SEE SLIDES 117-134 for further instructions.*

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears. PLEASE NOTE: SENSIT LZ30 laser-detected readings require an accelerated ramp up and down from and to 0.0%.*

DEVELOPERS:

Carefully read the description and review the visual aids.

PLEASE NOTE: The laser-detected gas readings of the SENSIT LZ30 require an accelerated ramp up from 0.0% and an accelerated ramp down to 0.0% within the device's user interface screen (depending upon the user's distance to or from a given gas leak source). The laser-based acquisition of the readings occur faster than on either of the CGI devices.

***DESCRIPTION**: The SENSIT LZ30 displays LEL % readings. The LZ30 can pick up readings from as close as 1.5 feet to a target surface or as far away as 100 feet away from a target surface.*

As the SENSIT LZ30 is used to detect IF there is a leak – rather than for pinpointing that leak gas readings on the SENSIT LZ30 user interface screen would NORMALLY not need to rise or fall as the user gets closer or farther from the source of a given gas leak. The user would NORMALLY aim the SENSIT LZ30 at a target surface (e.g., bush, grass surface, mailbox, street surface), with an invisible laser beam extending from the top of the SENSIT LZ30, reaching the target surface, and returning to the SENSIT LZ30 (much like a sonar system on a submarine that sends out a "ping" to reflect against nearest or nearby surfaces to detect their distances) with the gas reading appearing where the "0" is located (in the center of the user interface screen). Distance will appear where the "0.00m" is located.

As users CAN "scan the environment" rather than statically aim with the SENSIT LZ30, the gas readings still must react in REAL-TIME to that scanning, thus resulting in those readings rising and falling, depending upon where the user is aiming. The user will NOT be required to engage any of the physical LZ30 buttons (UP, DOWN, ON/MENU, OFF/BACK, MEASURE).

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The 35% upscale of the SENSIT CGI 3D model for "Inside Leak Investigation" will have to remain in place for "Outside Leak Investigation" (as well as for the SENSIT CGI WITH ATTACHMENT).

The SENSIT LZ30 will require a similar or larger upscale to allow successful viewing of its small screen.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

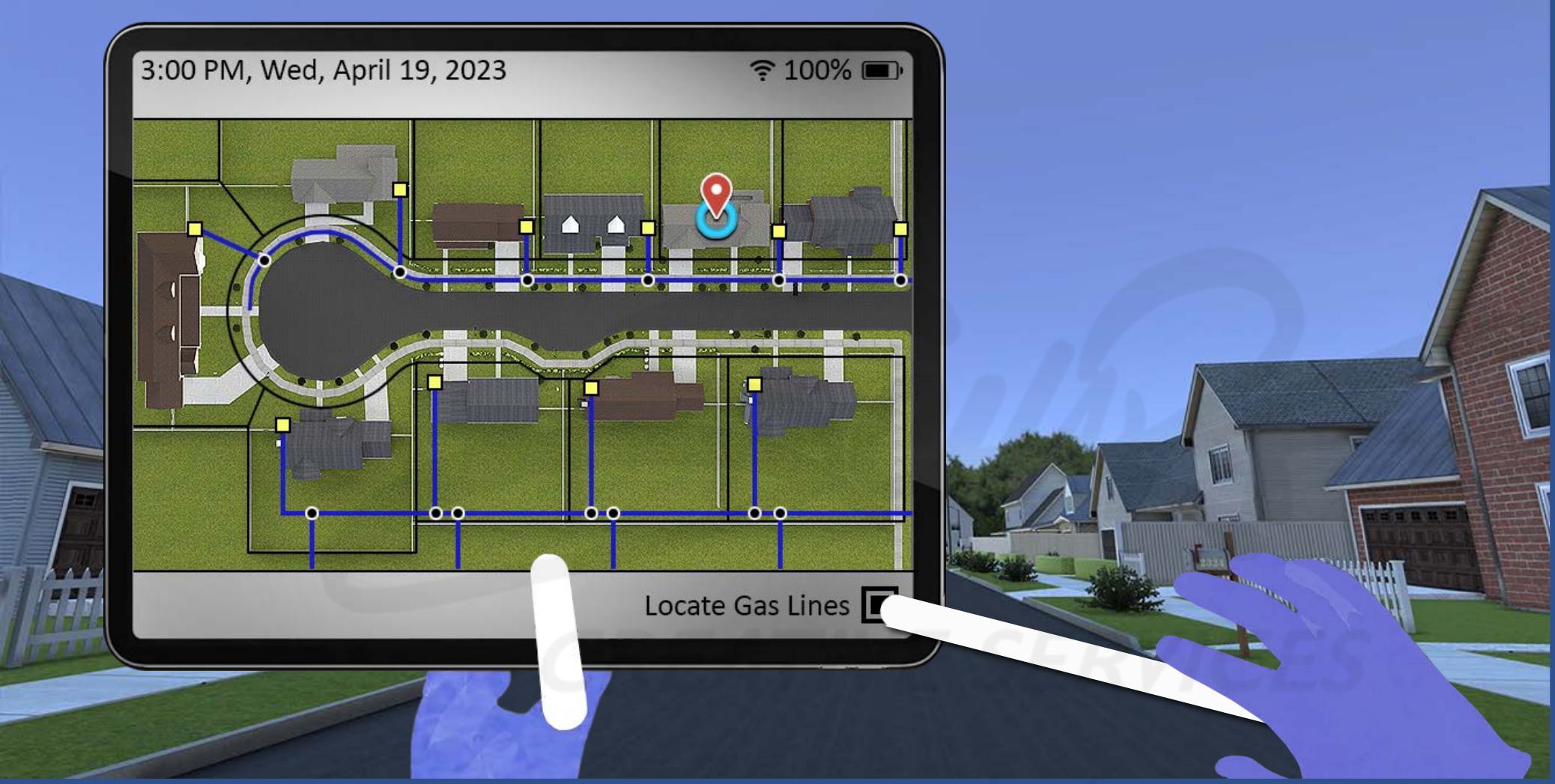
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

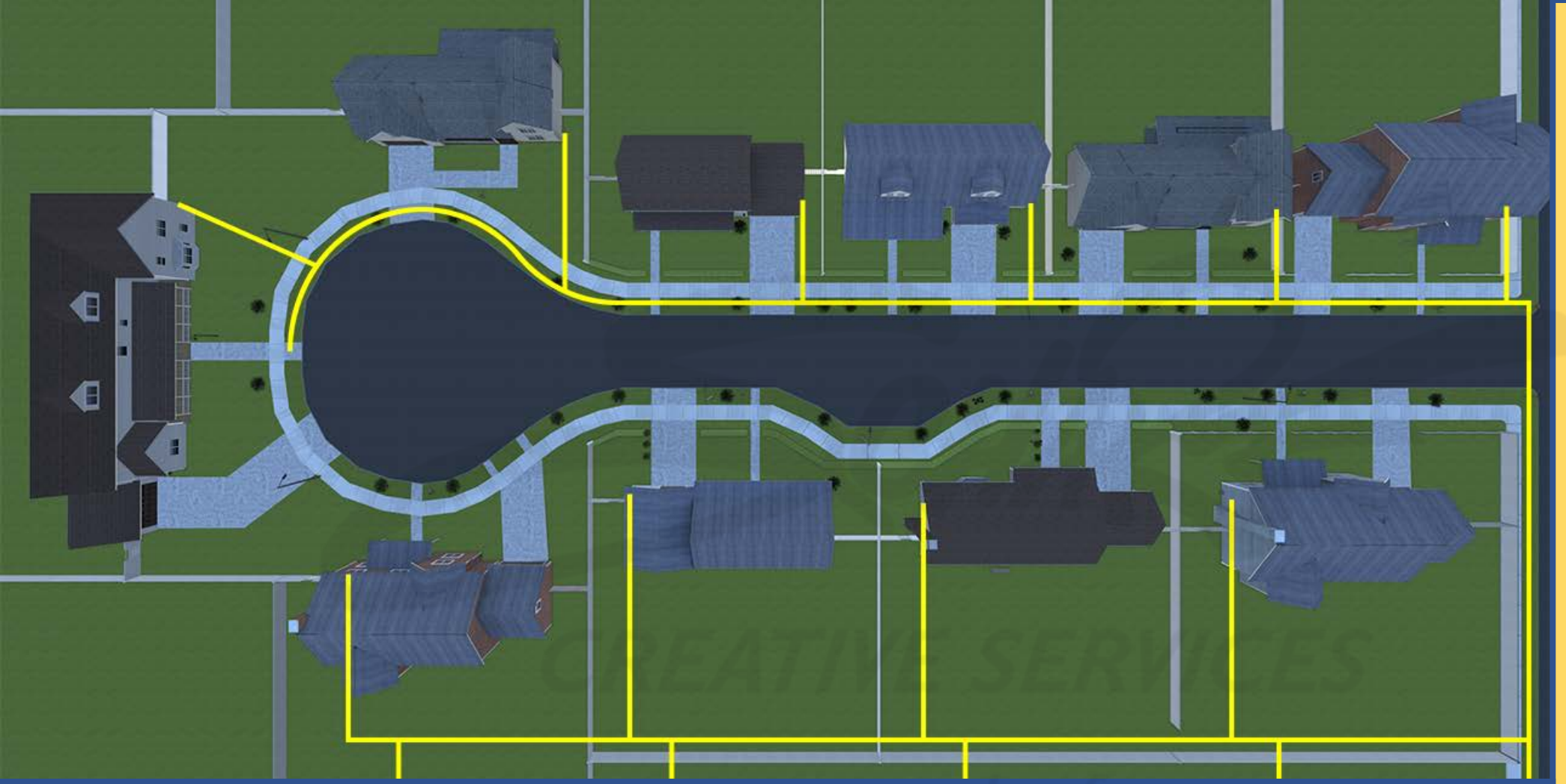
Carefully read the description and review the visual aids.



***DESCRIPTION**: The MAP (on a tablet PC just like the WORK ORDER) is a static screen, except for the user's ability to check the box next to LOCATE GAS LINES. The LOCATE GAS LINES feature will be grayed-out/disabled by default). IF-AND-WHEN the user detects gas (using the SENSIT CGI or SENSIT LZ30), the feature will be reenabled for use. The user would check that box using the laser from their right controller. That would activate an overlay schematic to display for the entire neighborhood. That overlay schematic would mimic the line-print-esque details seen within the above image.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The overlay schematic of the MAP would mimic ONLY the yellow gas line details from the above display within a given scenario. LOCATE GAS LINES can only be activated when either the SENSIT CGI or SENSIT LZ30 has successfully detected gas readings. Once LOCATE GAS LINES has been activated and once the gas lines are displayed throughout the neighborhood, the gas line overlay schematic will not deactivate. The user must play through the rest of their given scenario – or exit-and-restart their given scenario – for the gas line overlay schematic to be deactivated.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The SPRAY BOTTLE remains unchanged from "Inside Leak Investigation," and it is ONLY applicable to leak investigations AT and ON a given gas meter.

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The CALL 911 option remains unchanged from "Inside Leak Investigation."

***DESCRIPTION**: The user activates the TOOLS MENU, and 10 options appear. (1) NO SELECTION (by default), (2) WORK ORDER, (3) SENSIT CGI, (4) SENSIT LZ30, (5) MAP, (6) SENSIT CGI WITH BAR HOLE ATTACHMENT, (7) SPRAY BOTTLE, (8) CALL 911, and (9) WRENCH. The Y button toggles options. The X button confirms the user's choice (ALL on their left controller). The selected option then appears on the user's right controller, and the TOOLS MENU disappears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The WRENCH option remains unchanged from "Inside Leak Investigation."

Help Screen

Controls & Locations

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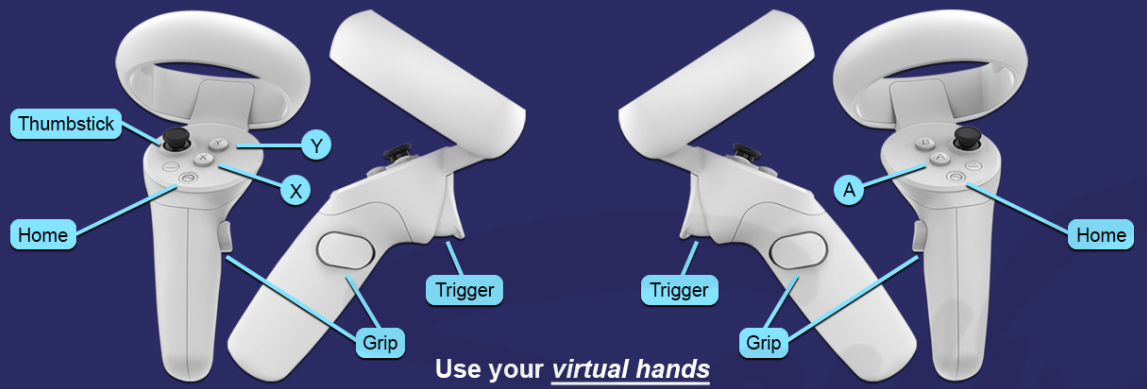
MDU Outside Leak Investigation Controls



Use your *virtual hands* to interact with objects.

LEFT

RIGHT

Thumbstick = Move Forward, Back, Left, Right
Trigger = Target Area *(When Measuring Gas)*
Trigger = Teleportation *(When Not Measuring Gas)*
Home = Exit simulation
Grip = Turn Left 90°
Y = Activate Tools Menu
Y = *Toggle* Tools Menu Options
X = *Select* Tools Menu Option

Interact with Tools = **Trigger**
Exit Simulation = **Home**
Turn Right 90° = **Grip**
Open Help Menu = **A**

NOTE: Press **Grip** *once* to quickly turn 90°. *Press-and-hold* **Grip** to smoothly turn, then *release* **Grip** at any interval to stop turning.

***DESCRIPTION*: HELP screen controls mimic those from "Inside Leak Investigation," with the following exceptions. The LEFT controller TRIGGER button has TWO modes. (1) TARGET AREA (When Measuring Gas) and (2) TELEPORTATION (to navigate distance). The LEFT controller GRIP button allows the user to PRESS ONCE to turn left 90° or PRESS-AND-HOLD to smoothly turn, then RELEASE to stop turning. The RIGHT controller GRIP button allows the user to PRESS ONCE to turn right 90° or PRESS-AND-HOLD to smoothly turn, then RELEASE to stop turning.**

***DEVELOPERS*:**

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2326 in SCENARIO 1.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2326 in SCENARIO 1.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2331 in SCENARIO 2.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2331 in SCENARIO 2.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2329 in SCENARIO 3.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2329 in SCENARIO 3.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2325 in SCENARIO 4.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2325 in SCENARIO 4.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2323 in SCENARIOS 5 and 6.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: HELP screen location – at an approximate 45° angle (with a cast shadow underneath) – in the front yard of the house 2323 in SCENARIOS 5 and 6.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

Customer Avatar

Customized Options

CREATIVE SERVICES
www.emscharf.com

***DESCRIPTION**: There will be six different customer avatars from which client facilitators can choose as a variable within each of the six scenarios. The voice bubble statements will be modified for "Outside Leak Investigation" from what they were in "Inside Leak Investigation."*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The fireman avatar remains visually unchanged. The voice bubble statement and/or audio clip associated with the CALL 911 fireman, however, will be modified to reflect the above.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

Scenario 1

House at 2326 – Front Yard

- Small-sized leak at gas line tee.
- No readings at gas meter riser.
- Brown bush/dead vegetation.
- Small underground gas migration.
- No customer evacuation.

CREATIVE SERVICES
www.emscharf.com

***DESCRIPTION**: The user will spawn – by default – at the beginning of the street, facing the displayed direction.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user raises their left wrist to look at their smartwatch and presses the Y button on their left controller to activate the TOOLS MENU.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user presses the Y button again to toggle through the TOOLS MENU options until reaching the WORK ORDER option. The user presses the X button to select the WORK ORDER option.*

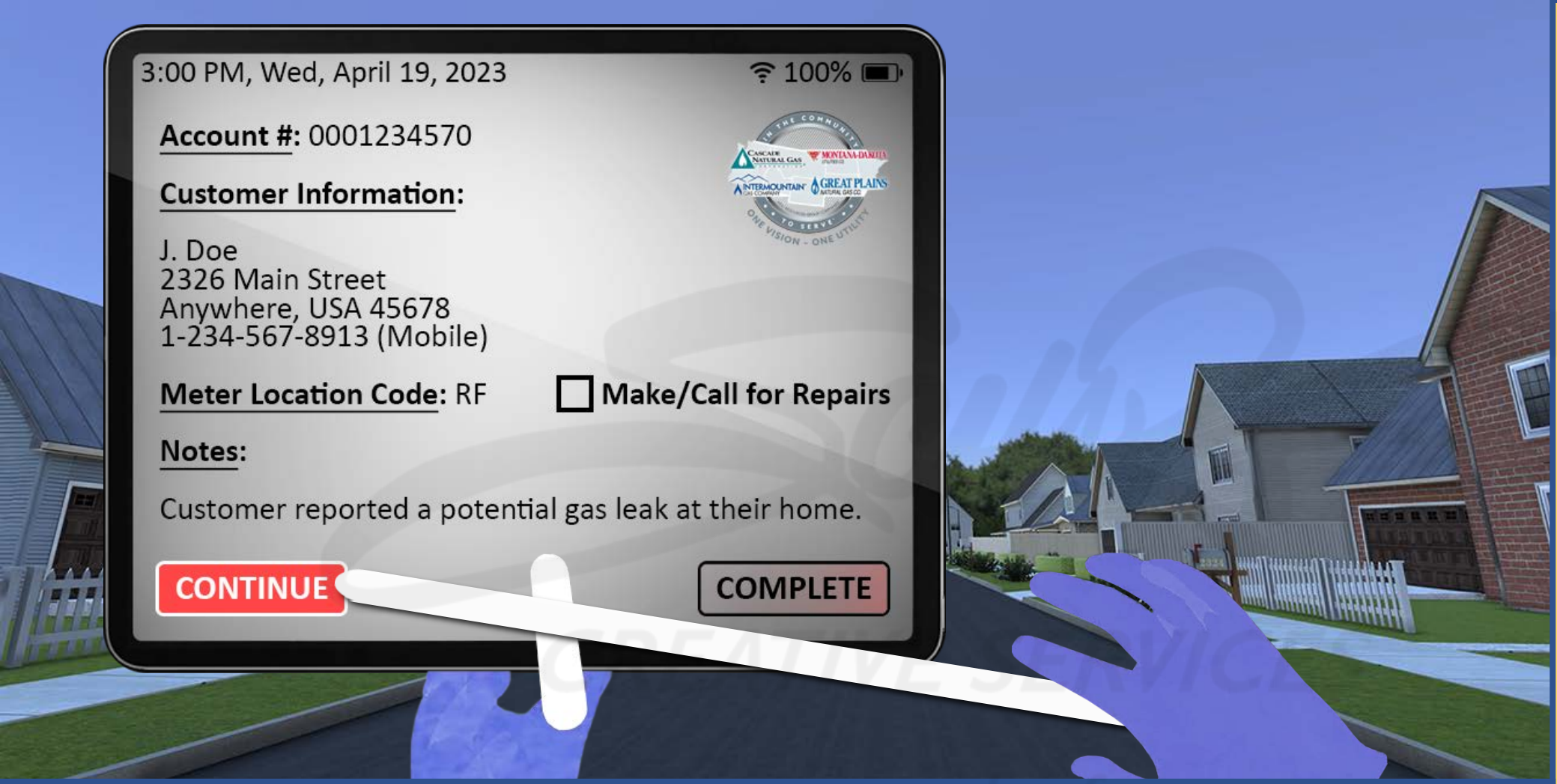
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The TOOLS MENU disappears, the WORK ORDER appears, and the user reviews the relevant WORK ORDER information.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user utilizes the laser on their right controller to tap the CONTINUE button on the WORK ORDER (which closes the WORK ORDER and allows the user to continue with the scenario).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards the assigned street address listed on the WORK ORDER.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: Before arriving at the assigned street address, the user presses the Y button on their left controller to activate the TOOLS MENU, toggles to the SENSIT LZ30 option, and presses the X button to select the SENSIT LZ30.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the assigned street address listed on the WORK ORDER. The user manipulates the SENSIT LZ30 to scan the distant area in front of the user as the user gets closer to the assigned street address.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the assigned street address listed on the WORK ORDER. The user manipulates the SENSIT LZ30 to scan the distant area in front of the user as the user gets closer to the assigned street address.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the assigned street address listed on the WORK ORDER. The user manipulates the SENSIT LZ30 to scan the distant area in front of the user as the user gets closer to the assigned street address.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the assigned street address listed on the WORK ORDER. The user manipulates the SENSIT LZ30 to scan the distant area in front of the user as the user gets closer to the assigned street address.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user stops just short of the assigned street address, as the SENSIT LZ30 has detected leak readings near the bush (on the left side of the screen).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: Due to the leak detection, the user presses the Y button on their left controller to activate their TOOLS MENU for another option.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user presses the Y button on their left controller to activate their TOOLS MENU and toggle to the MAP option. The user presses the X button to select the MAP option.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The MAP option appears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: As the SENSIT LZ30 had detected gas readings, that action has enabled the LOCATE GAS LINES feature.*

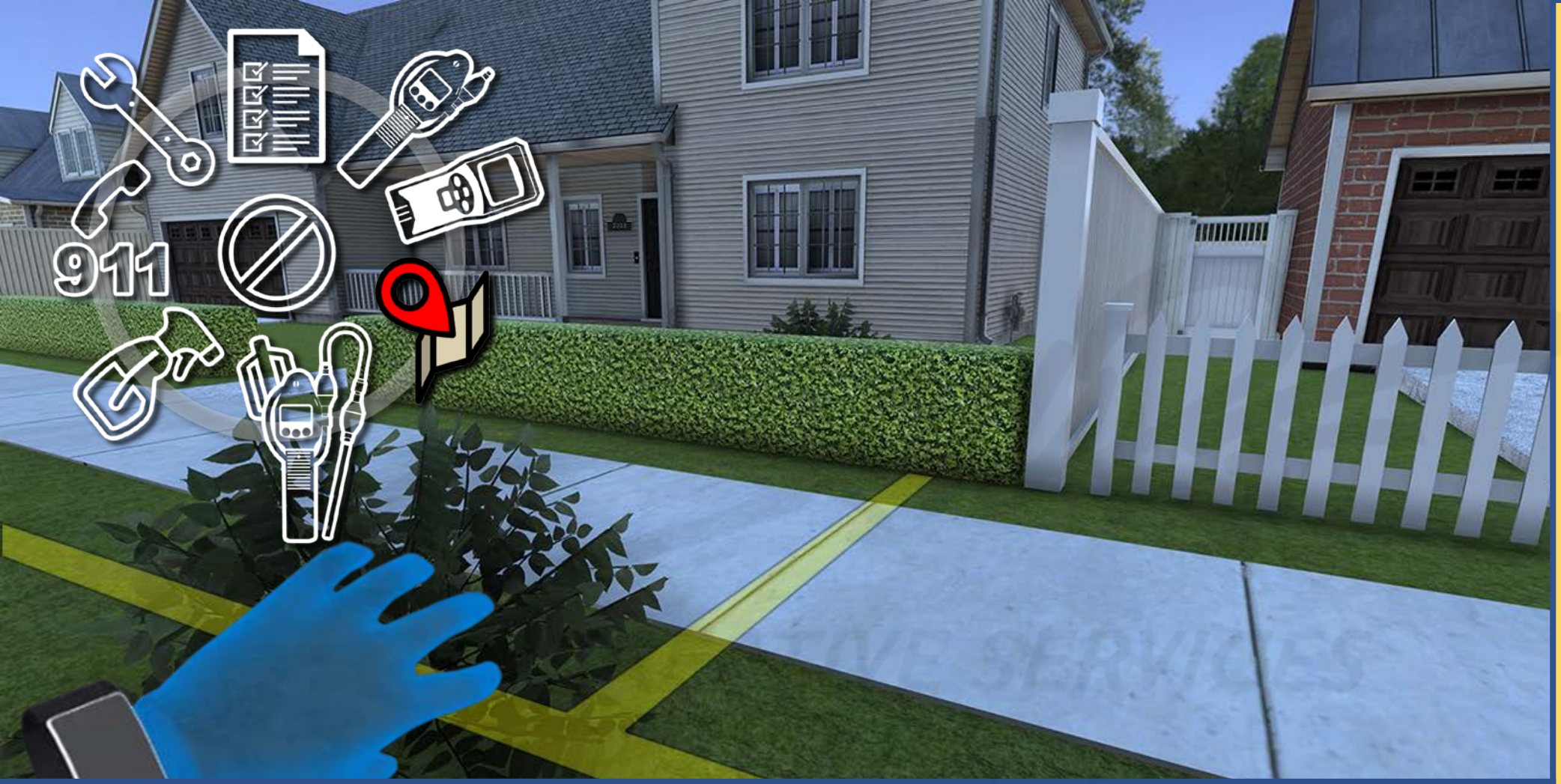
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: Activating the LOCATE GAS LINES feature triggers the simulation to display translucent lines which approximate underground gas line infrastructure.*

***DEVELOPERS**:*

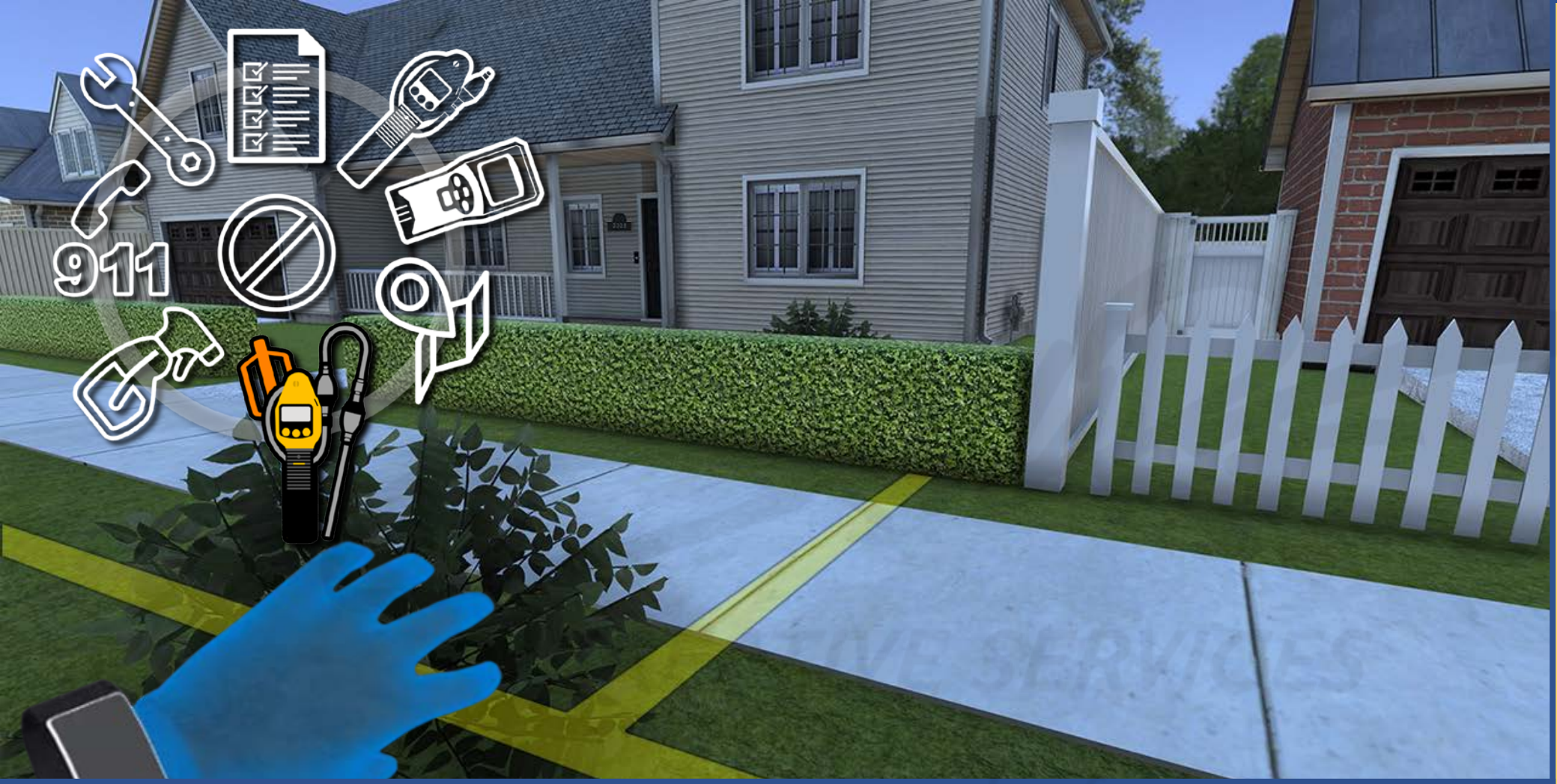
Carefully read the description and review the visual aids.



***DESCRIPTION**: The user then presses the Y button on their left controller to activate their TOOLS MENU and toggle to the SENSIT CGI WITH BAR HOLE ATTACHMENT.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user then presses the X button to select the SENSIT CGI WITH BAR HOLE ATTACHMENT.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The SENSIT CGI WITH BAR HOLE ATTACHMENT appears in the user's right controller. The user aims their left controller laser at the desired area of terrain into which they want to investigate gas leaks, and the user presses their left controller trigger button.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: Upon pointing-and-triggering the user's left controller laser at the desired spot on the ground, the SENSIT CGI WITH BAR HOLE ATTACHMENT remains within the user's right hand and the simulation plays a (3-5-second) canned/pre-determined animation of a BAR HOLE PROBE creating a hole in the ground. Please NOTE: The animation is a vertical, repeated "plunging" of the BAR HOLE PROBE into the ground to create a hole where gas readings can be taken. This animation is followed by a (3-second) canned/pre-determined SENSIT CGI WITH BAR HOLE ATTACHMENT animation.*

DEVELOPERS:

Carefully read the description and review the visual aids.

PLEASE NOTE: This slide further supports the guidance shared on SLIDES 23 and 24.

***DESCRIPTION**: The 3-second canned/pre-determined animation of the SENSIT CGI WITH BAR HOLE ATTACHMENT plays. The countdown must go in the order of "03, 02, 01, 00." Unlike with the BAR HOLE PROBE animation, the animated SENSIT CGI WITH BAR HOLE ATTACHMENT becomes translucent while playing. The SENSIT CGI WITH ATTACHMENT in the user's hand remains 100% opaque, because users need to be able to read the SENSIT CGI WITH BAR HOLE ATTACHMENT user interface screen.*

DEVELOPERS:

Carefully read the description and review the visual aids.

PLEASE NOTE: This slide further supports the guidance shared on SLIDES 23 and 24.

***DESCRIPTION**: Once the SENSIT CGI WITH BAR HOLE ATTACHMENT animation has been completed, the animation disappears, a yellow flag appears within the bar holed hole, and the highest reading (captured during the countdown) from that measurement is displayed on that flag. Displaying the measurements on BOTH SIDES of the yellow flags will help the users identify how "hot or cold" (or near or far) they are getting in their search for the leak source.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment.*

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Carefully read the description and review the visual aids.

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Carefully read the description and review the visual aids.

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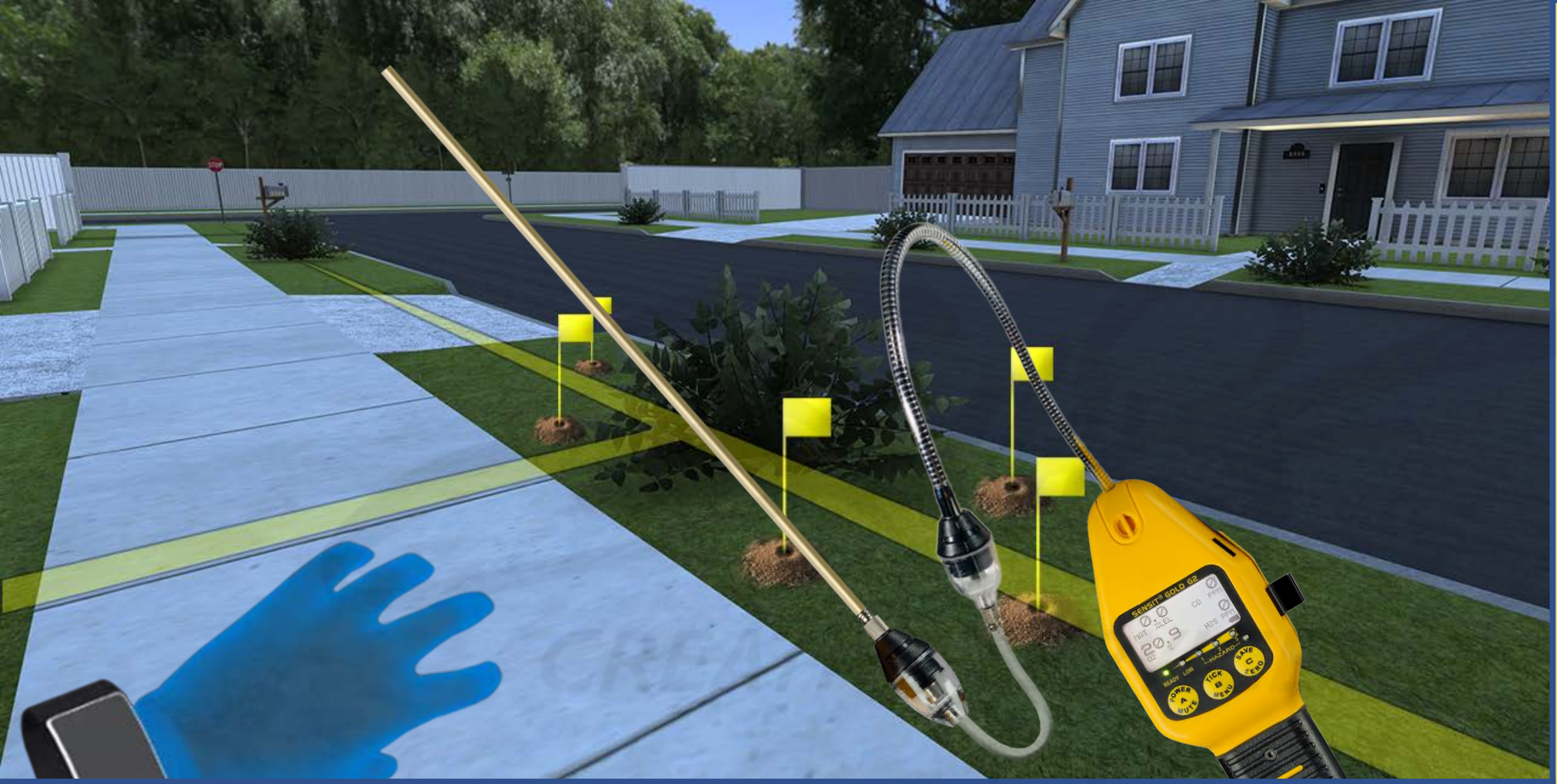
***DEVELOPERS**:*

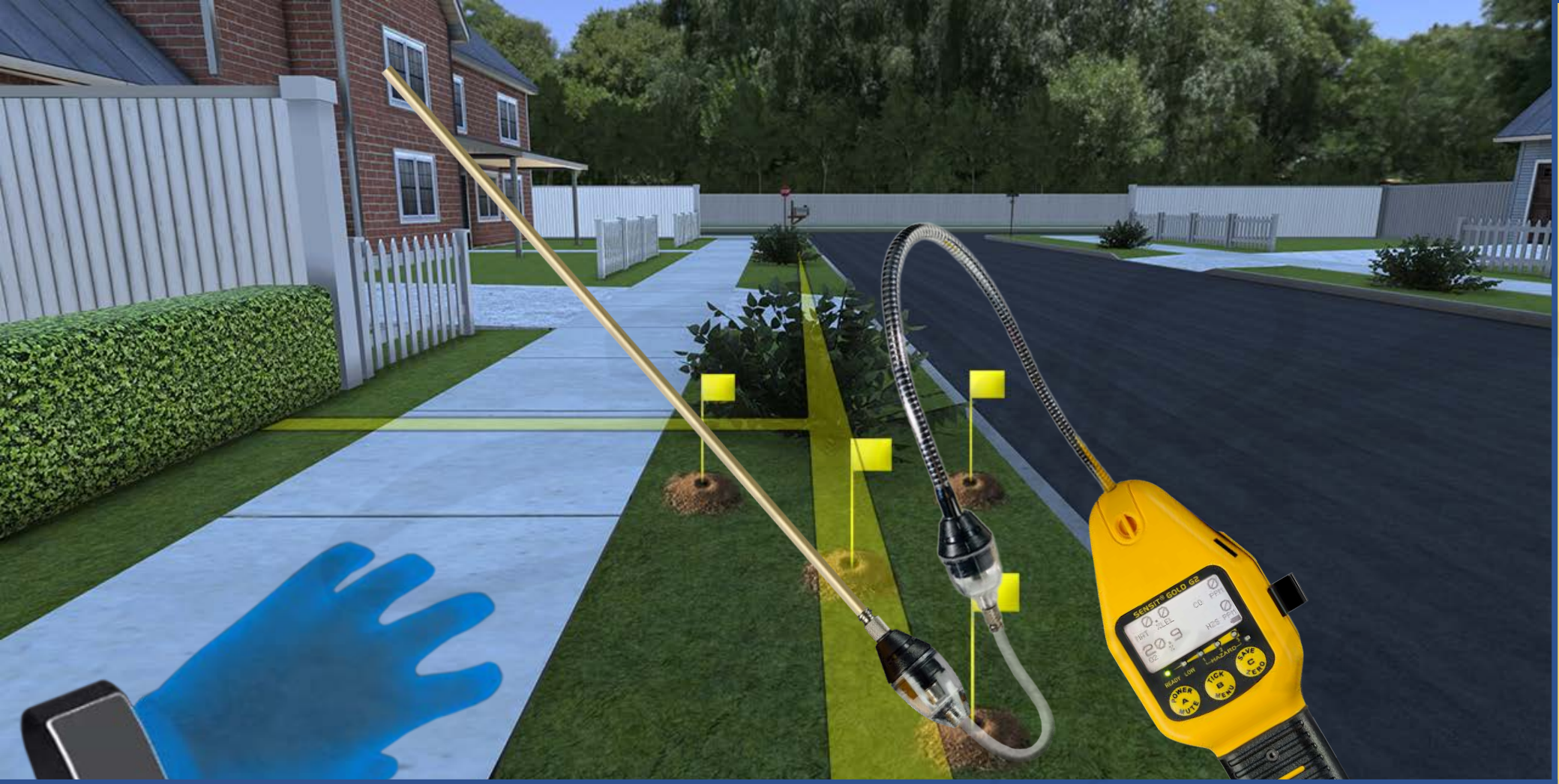
Carefully read the description and review the visual aids.



***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment.*

***DEVELOPERS**:*

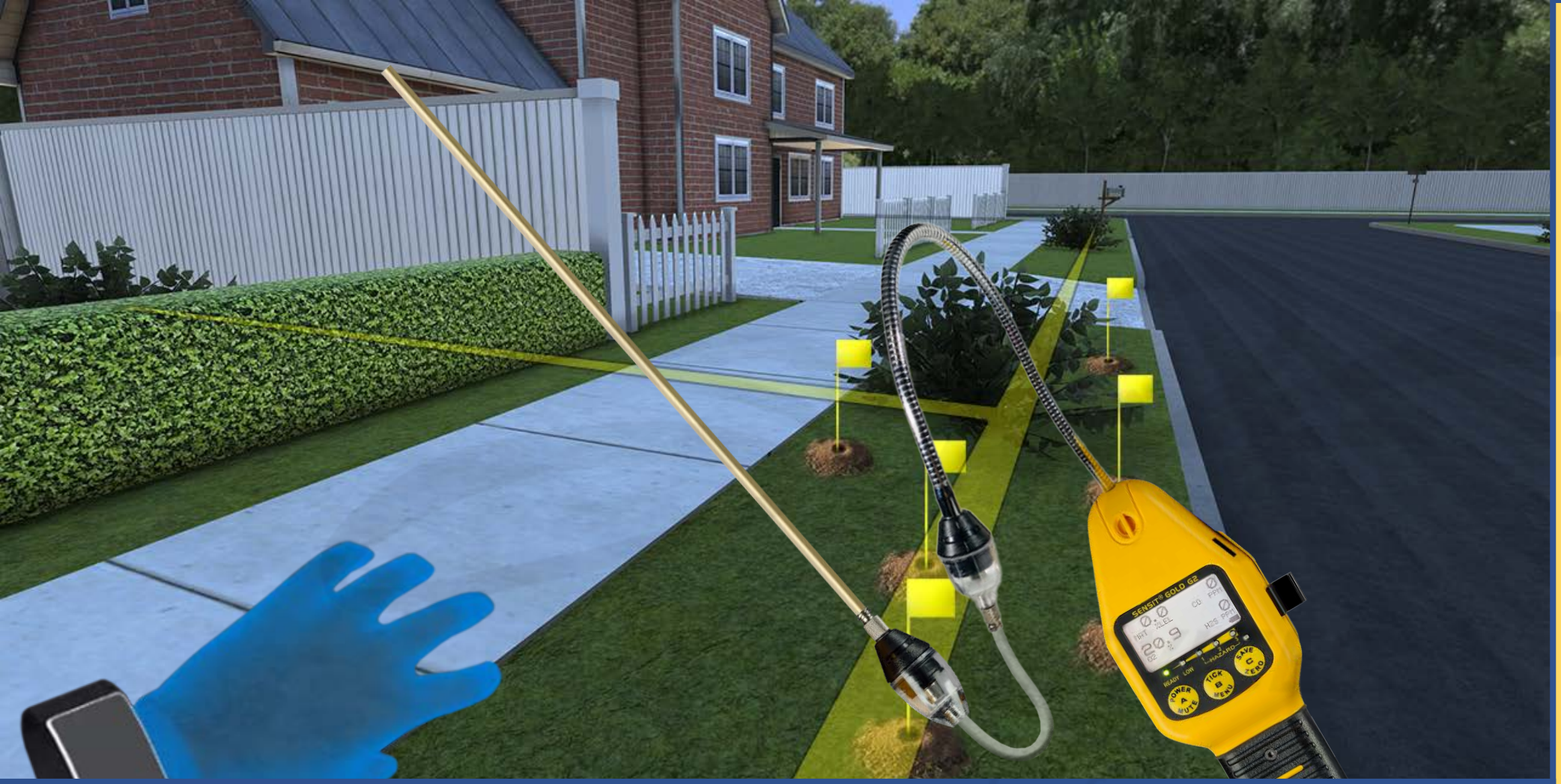
Carefully read the description and review the visual aids.



***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment.*

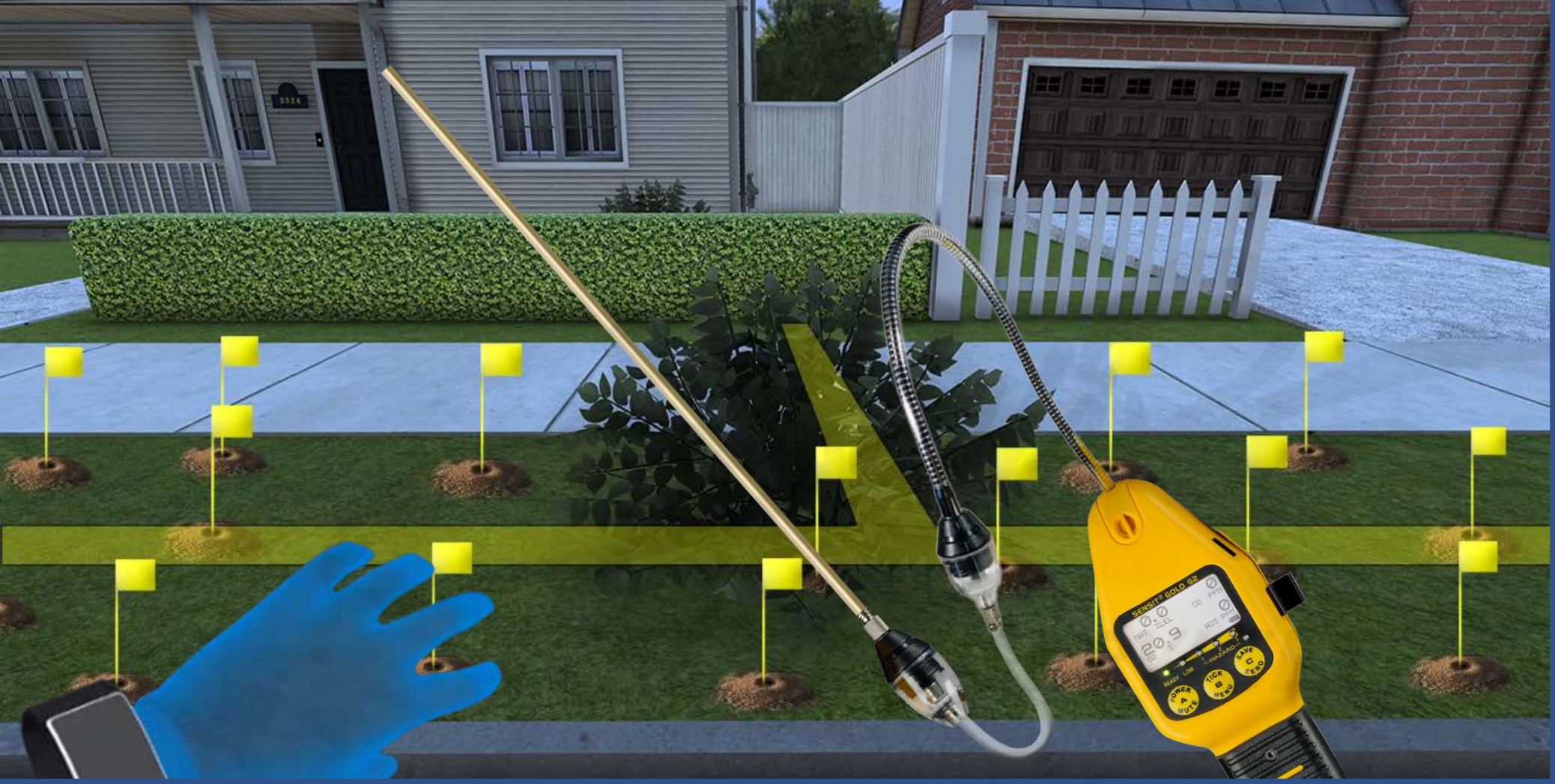
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



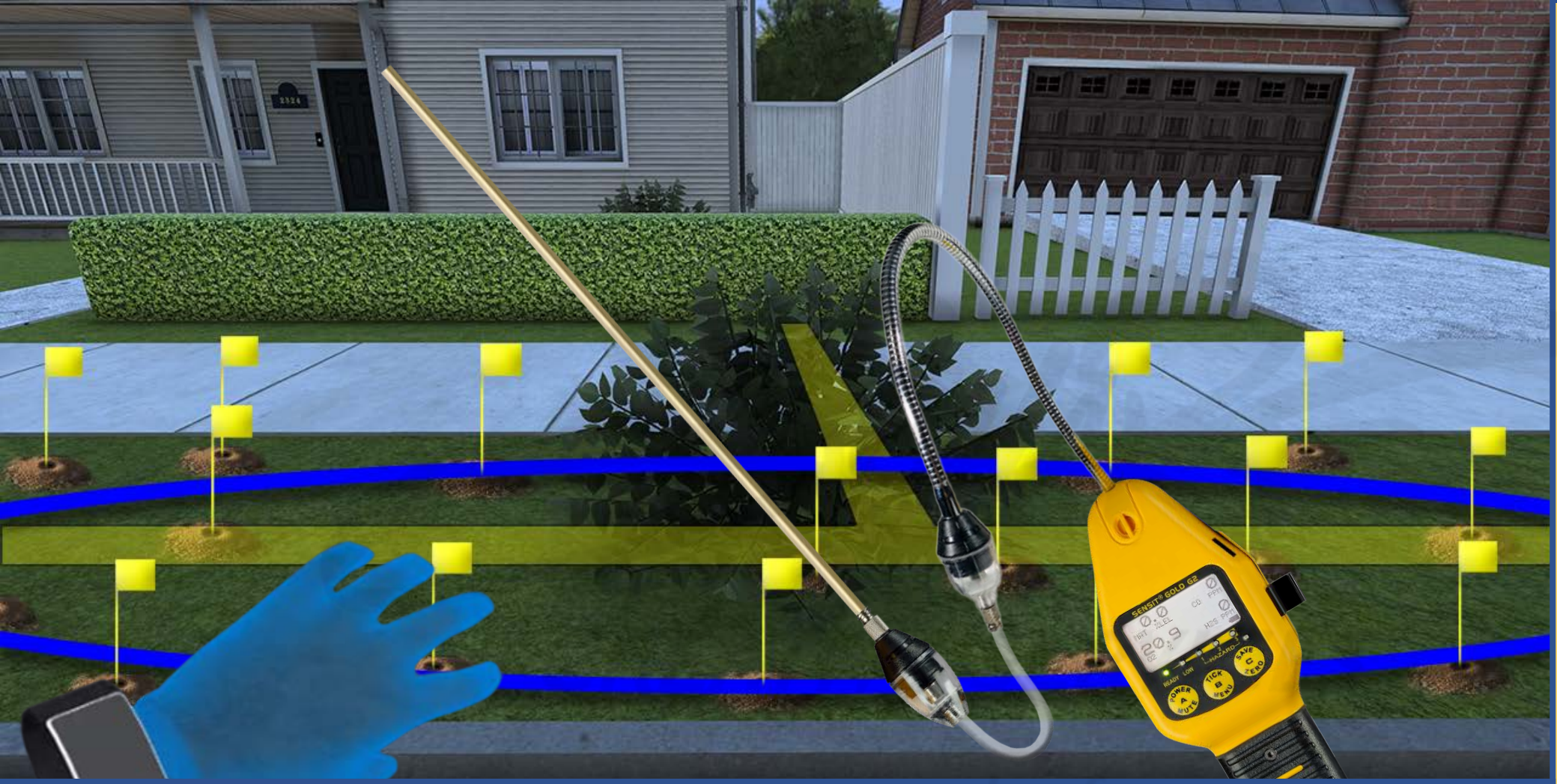
***DESCRIPTION**: SLIDES 75-86 display more bar holing and measurements from different angles within the simulation environment. Aside from locating the gas leak source (from highest readings to intermediate readings within the gas-saturated area), for each ZERO (0.0) % reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). SEE SLIDES 117-134 for further guidance on how the blue CONFIRMATION OUTLINE is activated and completed.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The CONFIRMATION OUTLINE, ALL the yellow flags, and ALL the bar holed holes will remain visible until the user completes a given scenario.

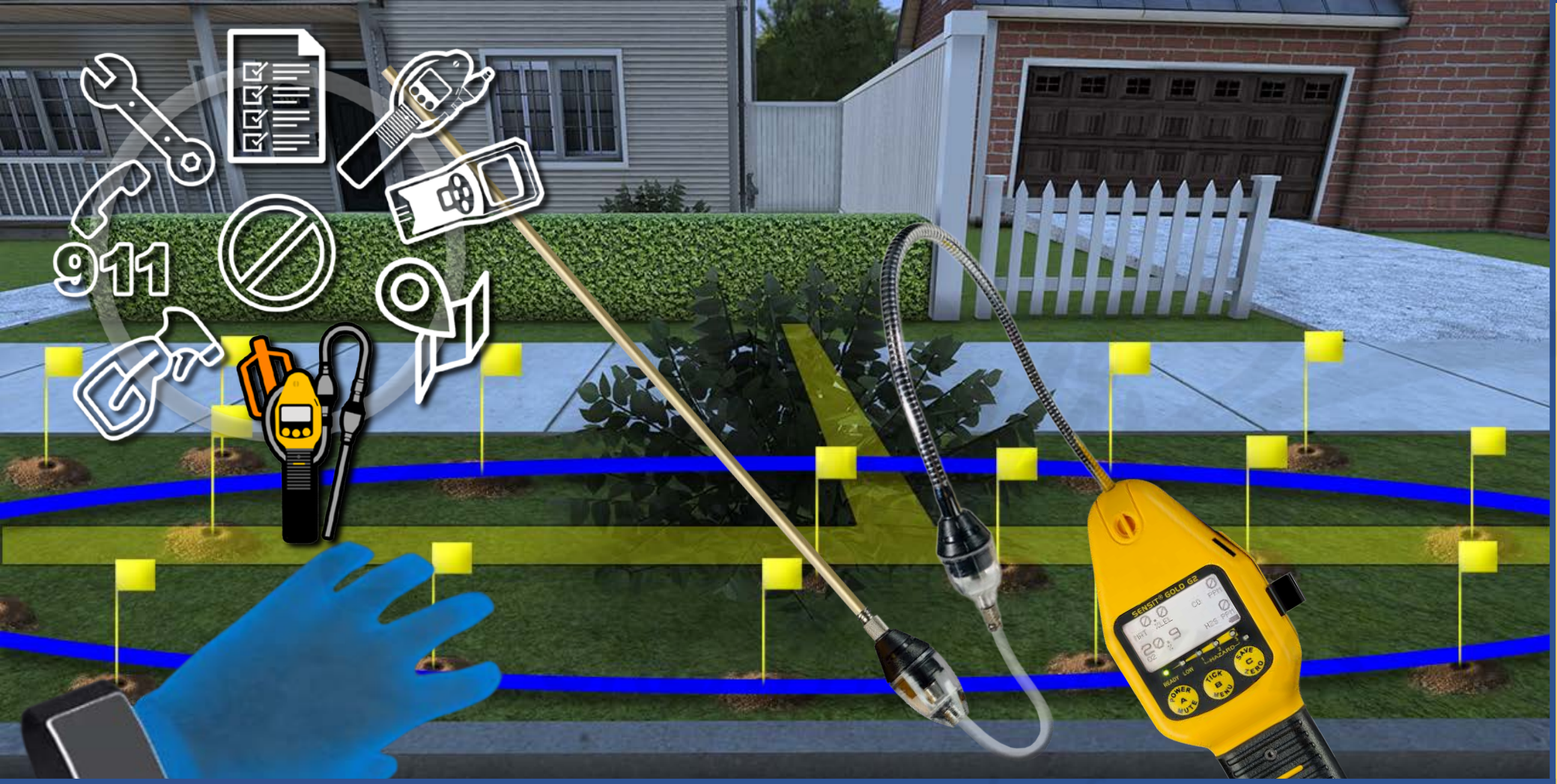
SEE SLIDES 117-134 for further guidance on how the blue CONFIRMATION OUTLINE is activated and completed.



***DESCRIPTION**: Once the user has sufficiently bar holed enough to identify the maximum extents of the gas leak – reaching far enough outward from the source of the leak to detect a sufficient number of ZERO (0.0) % readings – the yellow flags will automatically disappear, and the CONFIRMATION OUTLINE will be completed as a reward or acknowledgment for the user having achieved a key learning goal. Please NOTE: The CONFIRMATION OUTLINE, ALL the yellow flags, and ALL the bar holed holes – as shown above – will remain visible until the user completes the scenario.*

***DEVELOPERS**:*

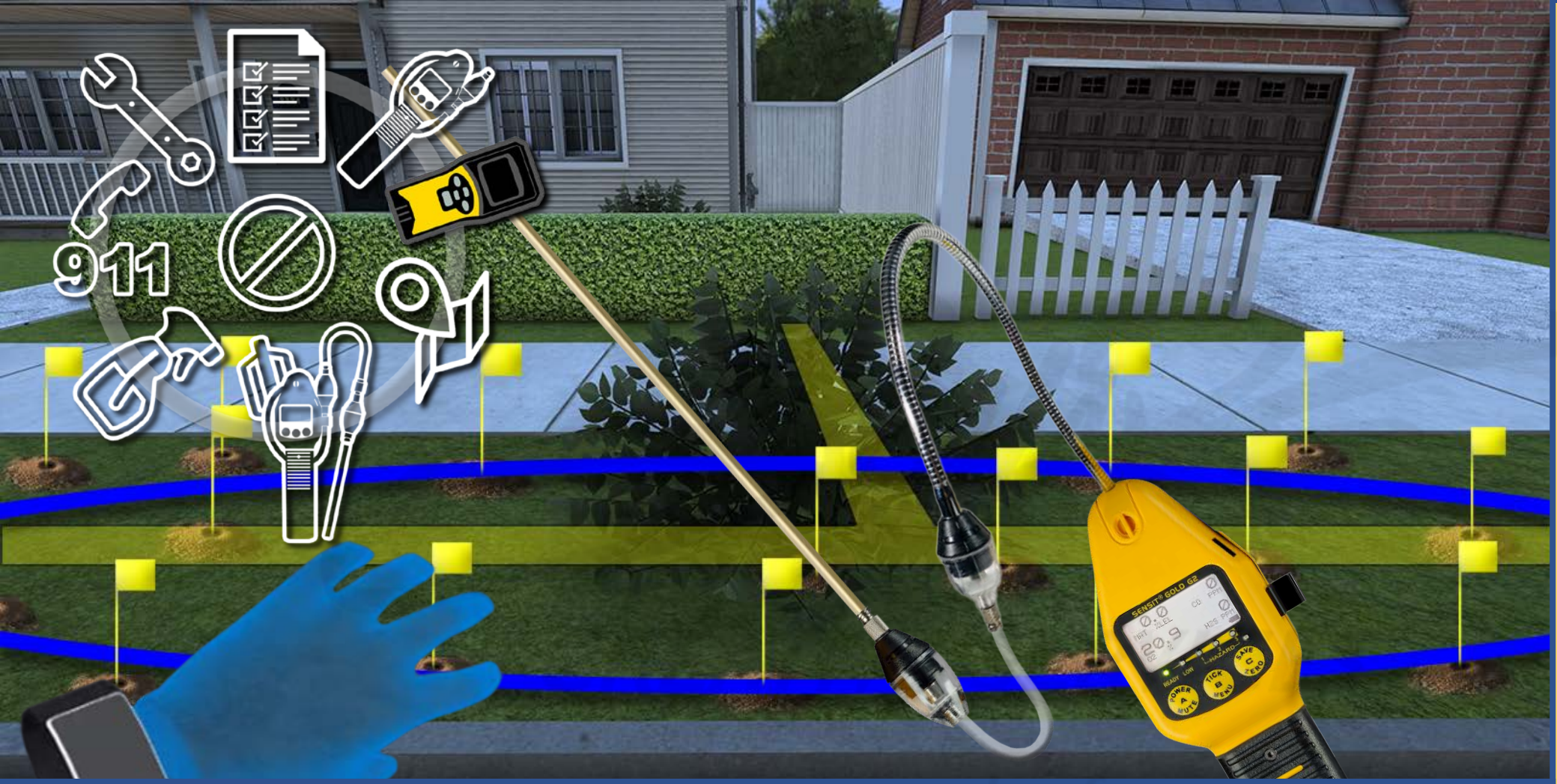
Carefully read the description and review the visual aids.



***DESCRIPTION**: While some users may CHOOSE to immediately activate the WORK ORDER from their TOOL SET and press the COMPLETE button to finish the simulation, other users will remember to contact the customer to gather any further, useful information about the reported leak, and perform a LEAK SURVEY, as well. SEE SLIDES 117-133 for further guidance on how the blue CONFIRMATION OUTLINE is activated and completed.*

***DEVELOPERS**:*

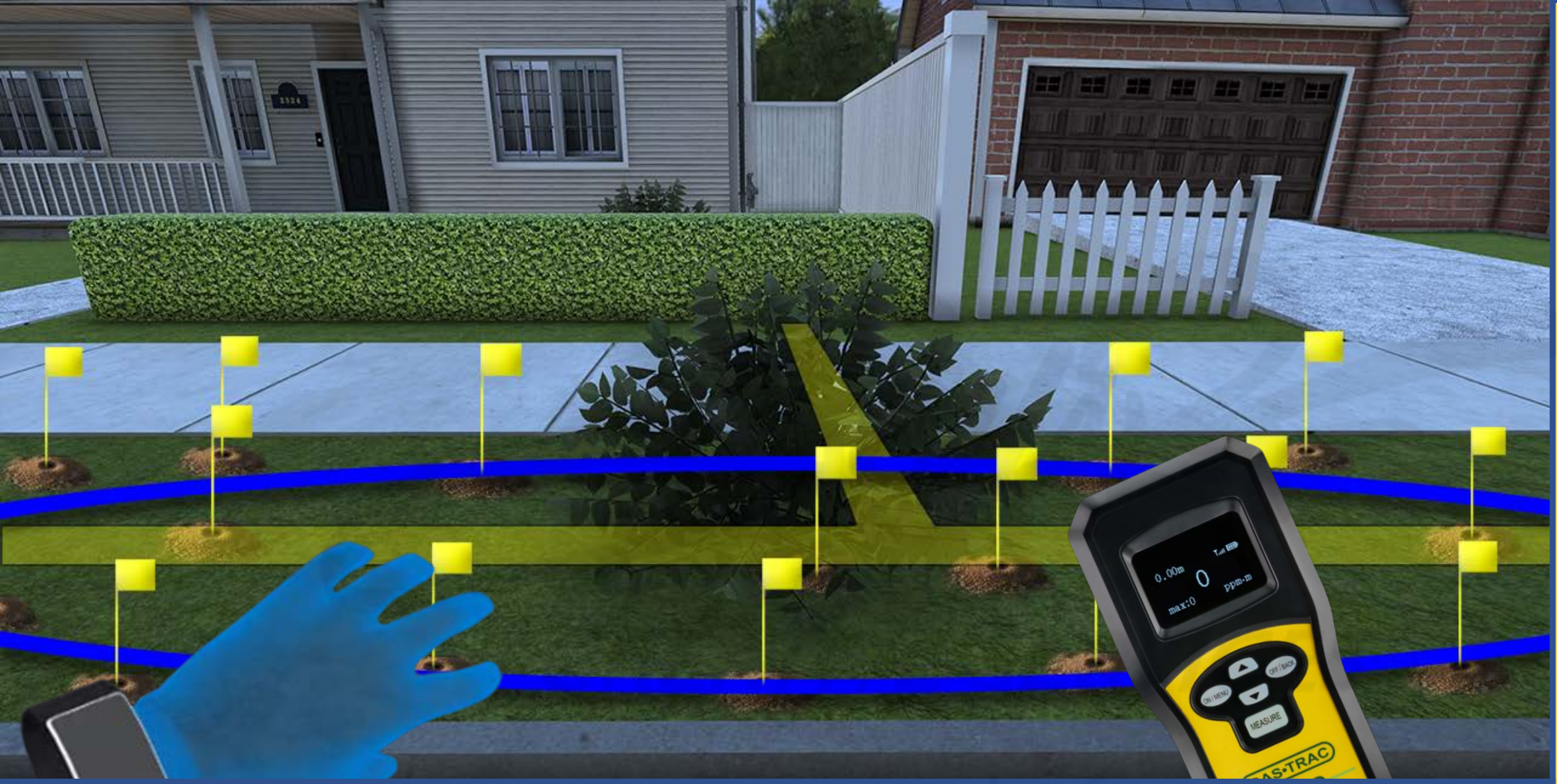
Carefully read the description and review the visual aids.



***DESCRIPTION**: Regardless of whether the user CHOOSES to contact the customer at the front door, the user can CHOOSE to immediately begin scanning the remainder of the property with their SENSIT LZ30.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: Regardless of whether the user CHOOSES to contact the customer at the front door, the user can CHOOSE to immediately begin scanning the remainder of the property with their SENSIT LZ30.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: Regardless of whether the user CHOOSES to contact the customer at the front door, the user can CHOOSE to immediately begin scanning the remainder of the property with their SENSIT LZ30.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user approaches the front door of the home to engage the customer.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user knocks – with their left controller – on the door (to avoid the mistake of ringing the doorbell and risking ignition of gas in the atmosphere).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The "NO DOORBELL" policy from "Inside Leak Investigation" is to be included in "Outside Leak Investigation."

***DESCRIPTION**: The customer avatar responds by appearing on the porch of their home and sharing a comment with the user (generically describing their gas leak concerns).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

As the user determines they do not have to evacuate the customer (through CALL 911), the customer avatar disappears from the porch the moment the user departs to inspect other areas of the property.

***DESCRIPTION**: The user then heads over to the gas meter to investigate any potential leaks sources there.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user presses the Y button on their left controller to activate the TOOLS MENU.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user presses the Y button, once again, to toggle the SENSIT CGI, and the user presses the X button to select the SENSIT CGI.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the gas meter location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to continue navigating towards the gas meter location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user investigates the (1) GAS METER, (2) GAS METER INDEX (containing the dials), (3) GAS METER RISER, (4) GAS METER SHUTOFF VALVE, and the (5) CUSTOMER LINE SHUTOFF VALVE. No leaks are discovered there.*

***PLEASE NOTE**: While the above five items must be trackable within ENDEAVR USER REPORTING, the SHUTOFF VALVES should be ENABLED/DISABLED variables for facilitators within ENDEAVR, as well.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids. There must be collision volumes on for the GAS METER, GAS METER INDEX (containing the dials), GAS METER RISER, GAS METER SHUTOFF VALVE, and the CUSTOMER LINE SHUTOFF VALVE.

There must also be a corresponding VALVE variable dropdown menu within ENDEAVR to allow users to select which valve can be a leak source.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards the other areas of the house for diligent leak investigation (including the remainder of the front yard, the side yard, and the back yard).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user presses the Y button on their left controller to activate the TOOLS MENU.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user toggles back to and selects the SENSIT LZ30, as they must resume distance scanning for gas leaks.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property (remainder of the front yard, side yard, and back yard).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property (remainder of the front yard, side yard, and back yard).*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property (remainder of the front yard, side yard, and back yard). The user approaches and contacts the TELEPORTATION CYLINDER (located on both sides of the fence gate) to navigate from the side yard to the back yard.*

***DEVELOPERS**:*

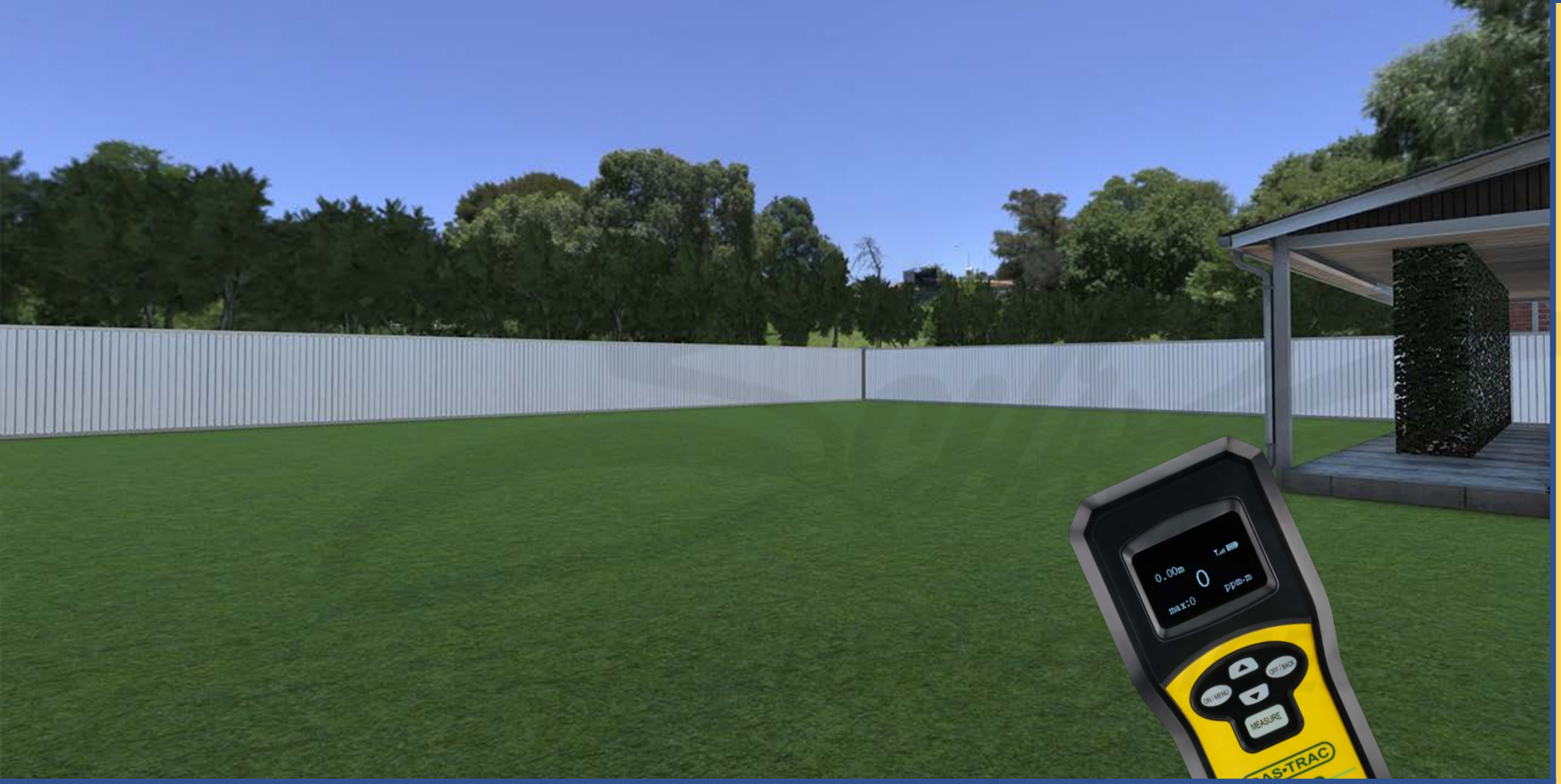
Carefully read the description and review the visual aids.

Apply the TELEPORTATION CYLINDERS to both sides of the fence gates (in the same way they were used for front door access within "Inside Leak Investigation").

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property.*

***DEVELOPERS**:*

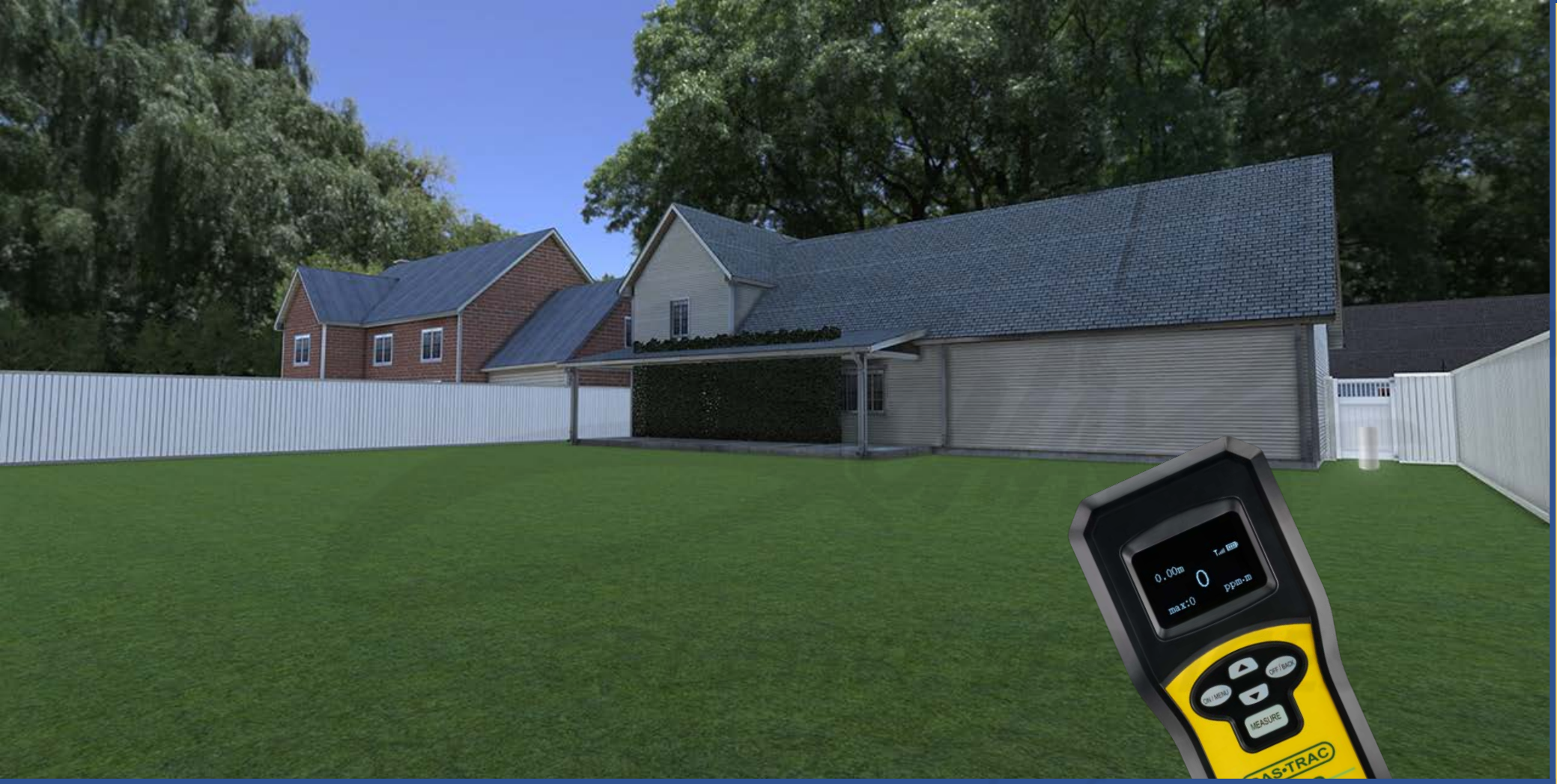
Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property.*

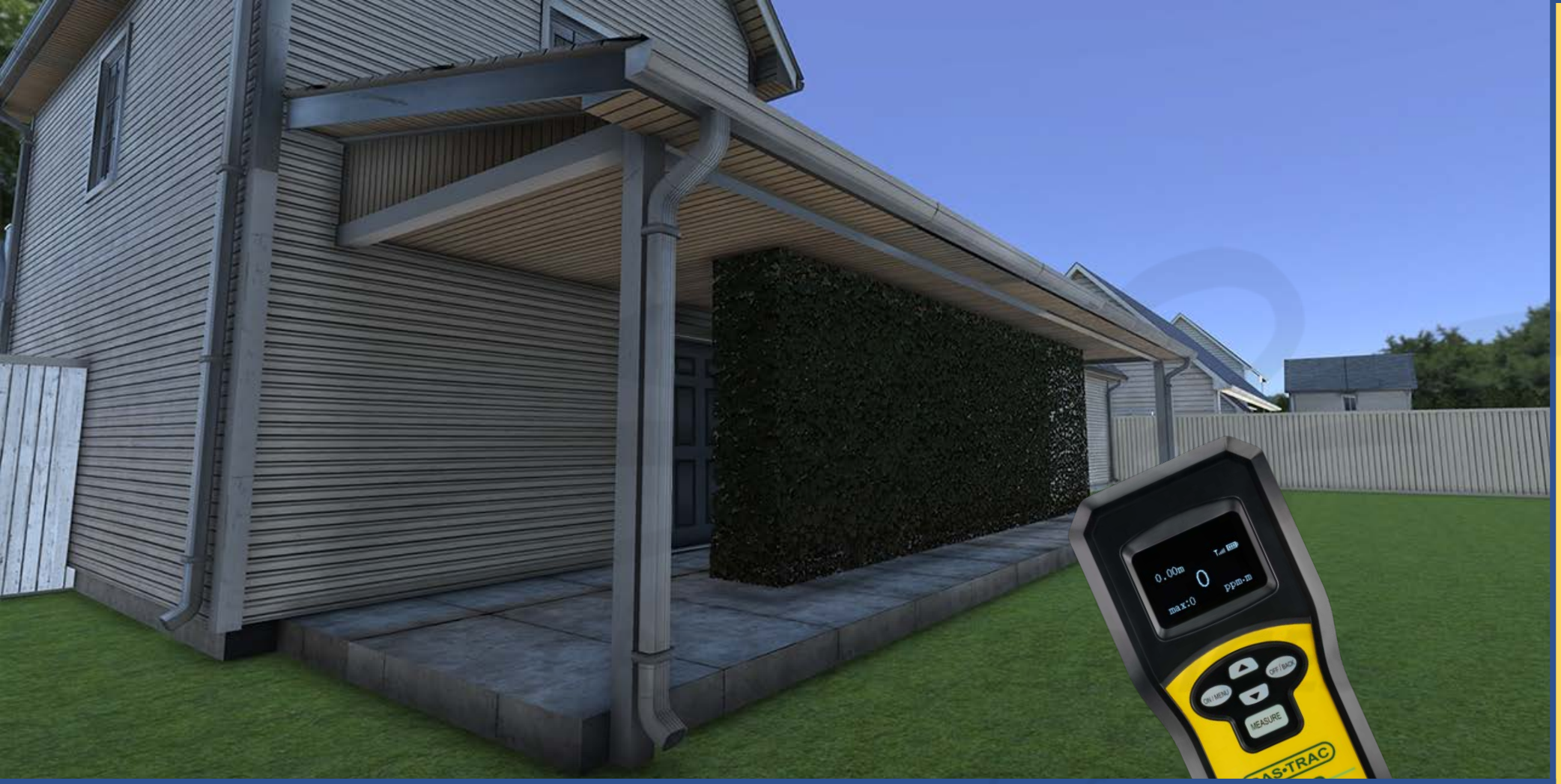
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards and through the remaining areas of the house property. The user approaches and contacts the TELEPORTATION CYLINDER (located on both sides of the fence gate) to return from the back yard to the side yard.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards the front yard.*

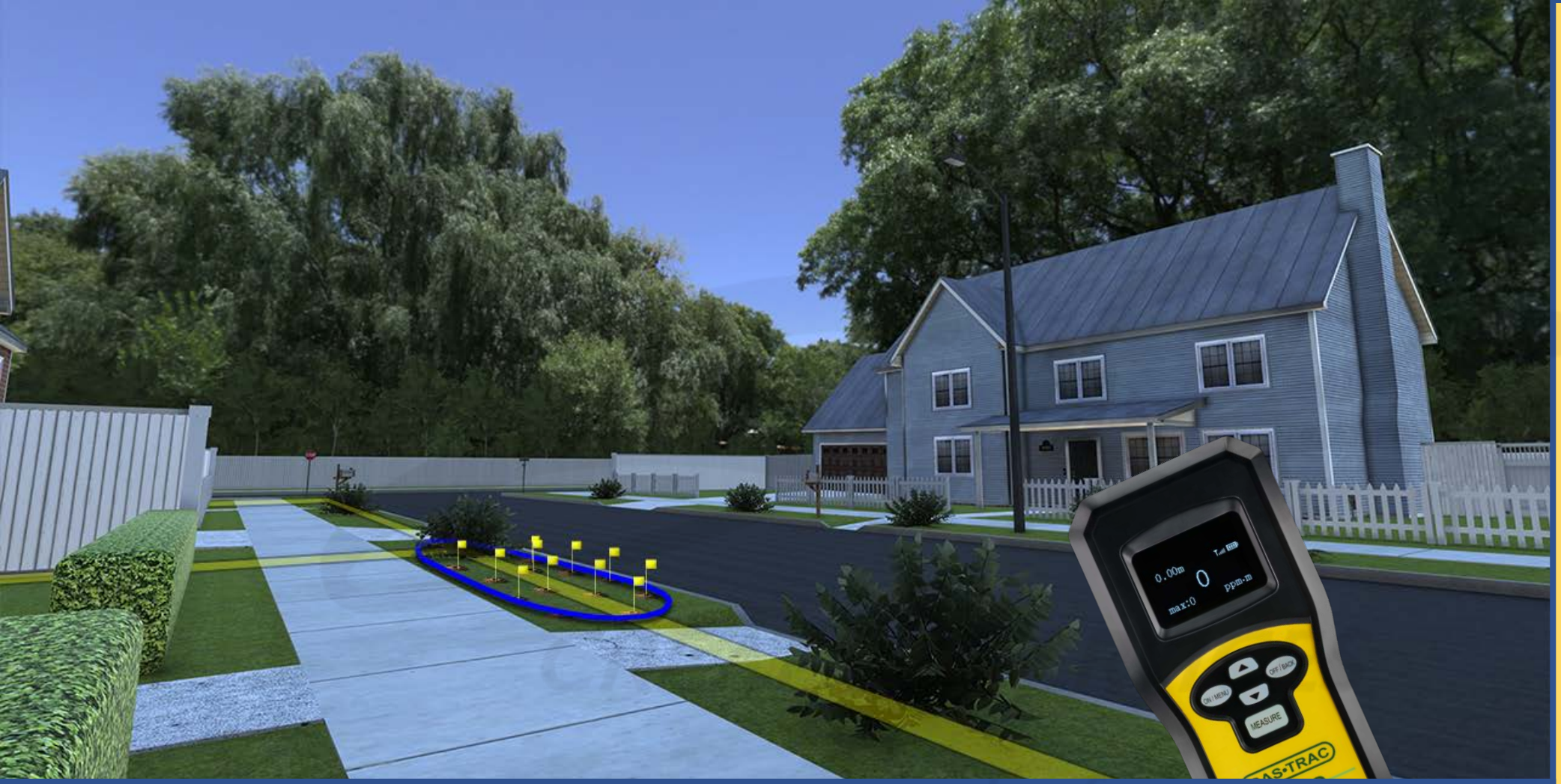
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate towards the front yard.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate back towards the successfully identified leak location.*

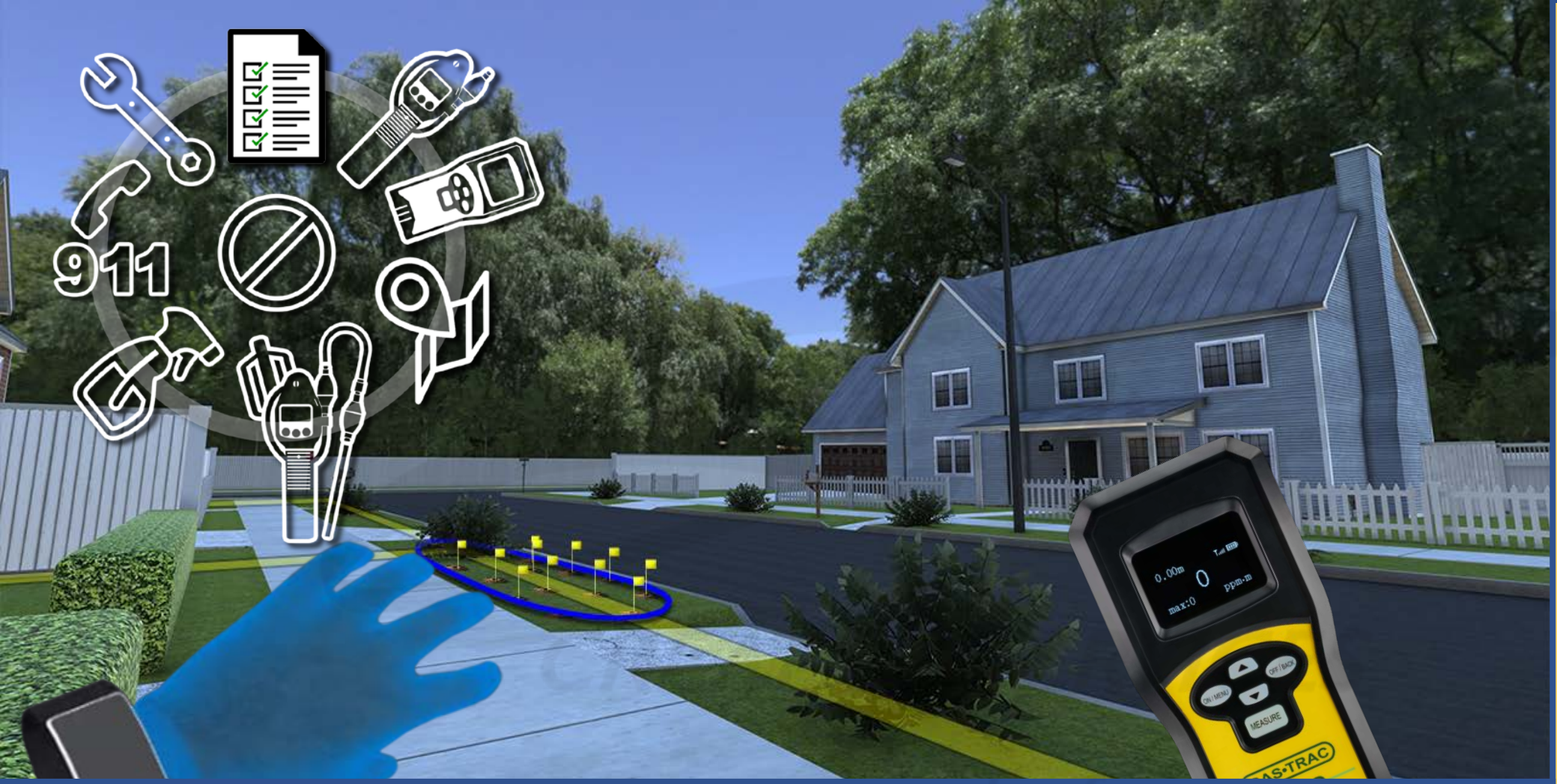
***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate back towards the successfully identified leak location. The user then activates the TOOLS MENU and changes options from the SENSIT LZ30 to the WORK ORDER.*

***DEVELOPERS**:*

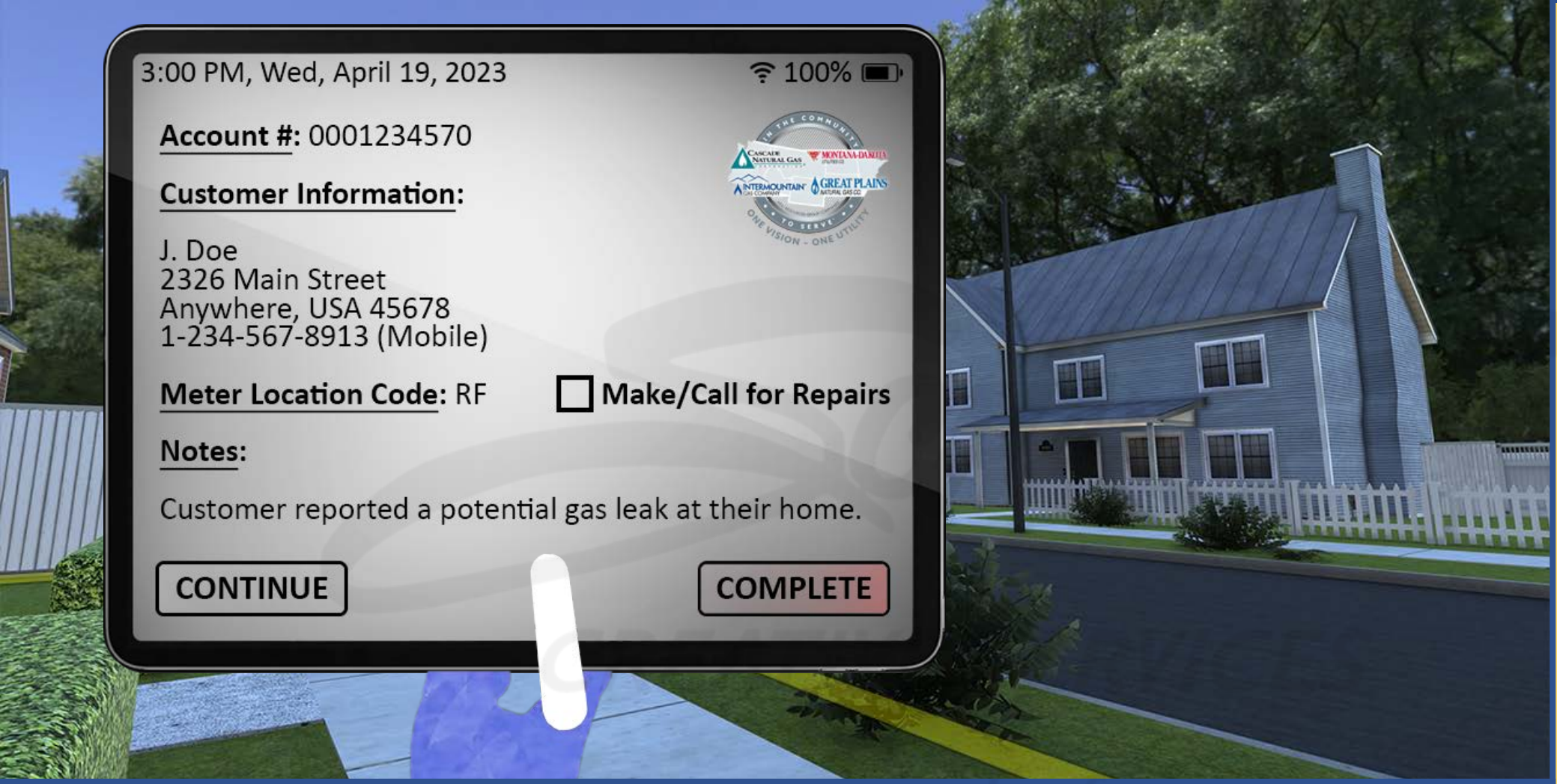
Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates the THUMBSTICK button on their left controller to navigate back towards the successfully identified leak location. The user then activates the TOOLS MENU and changes options from the SENSIT LZ30 to the WORK ORDER.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The WORK ORDER option appears.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

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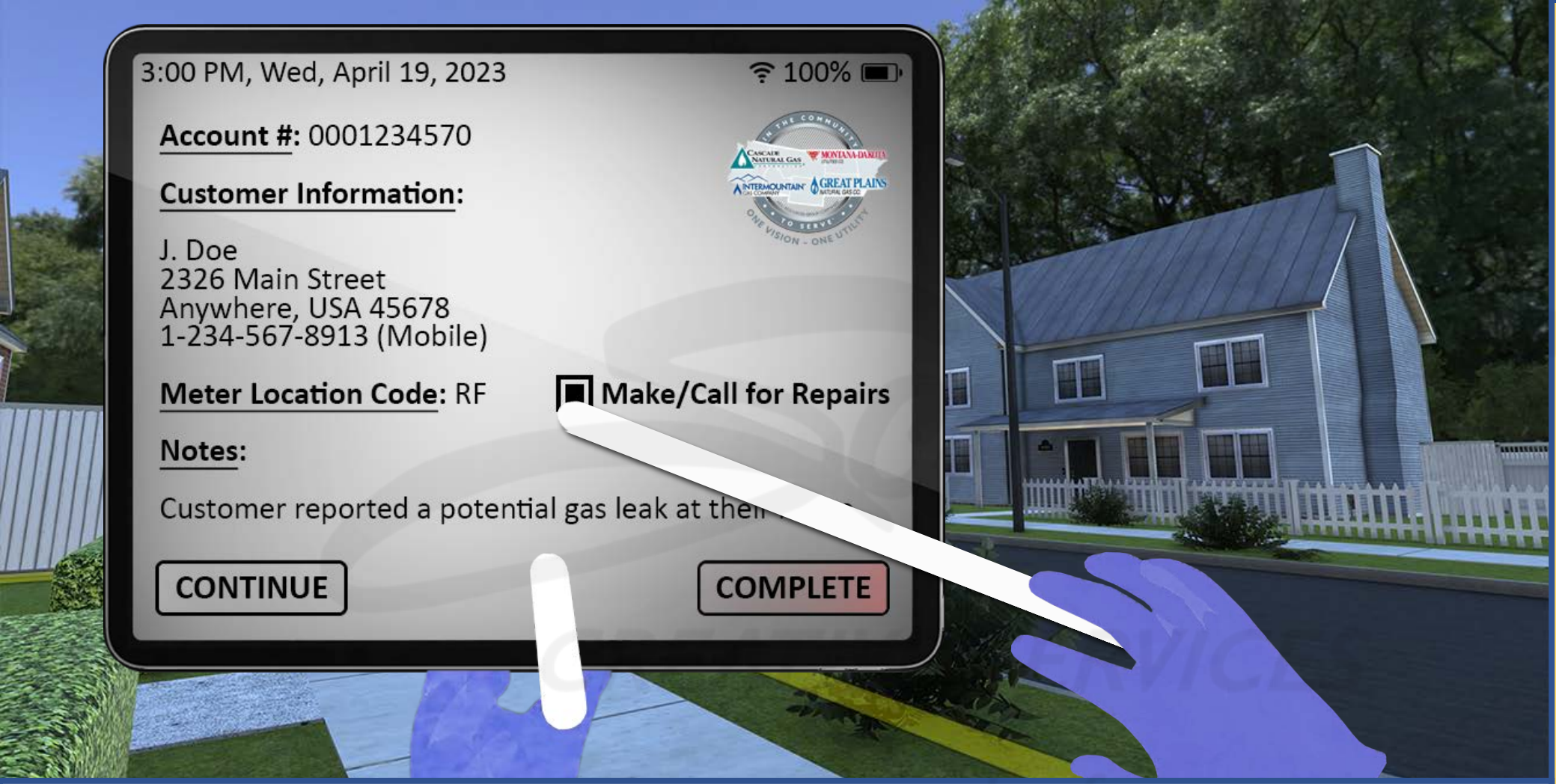
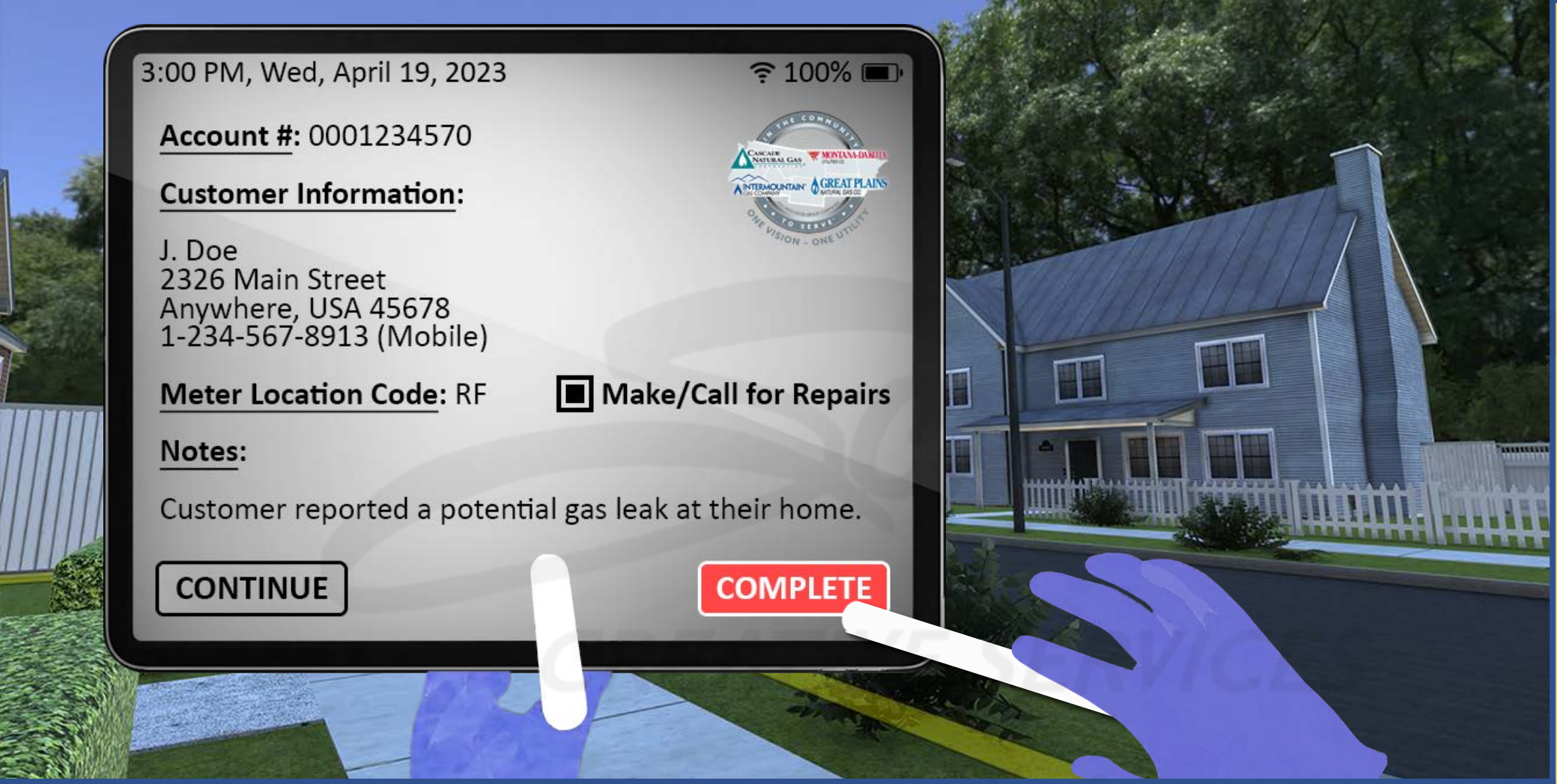


***DESCRIPTION**: The user manipulates their right controller laser to check the box for MAKE/CALL FOR REPAIRS. Again, the user can forget or choose to ignore MAKE/CALL FOR REPAIRS. That decision will not prevent the user from pressing the COMLETE button and concluding the simulation. That decision will merely be reflected within the ENDEAVR user reporting.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The user manipulates their right controller laser to press the COMPLETE button. The simulation successfully concludes.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

***DESCRIPTION**: The outside leak for SCENARIO 1 is located between the sidewalk and the street, just ahead of the front yard of HOUSE 2326. SLIDES 117-134 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 1.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

SLIDES 117-134 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 1.

***DESCRIPTION**: The outside leak for SCENARIO 1 is located between the sidewalk and the street, just ahead of the front yard of HOUSE 2326. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a CONFIRMATION OUTLINE should appear to acknowledge success.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

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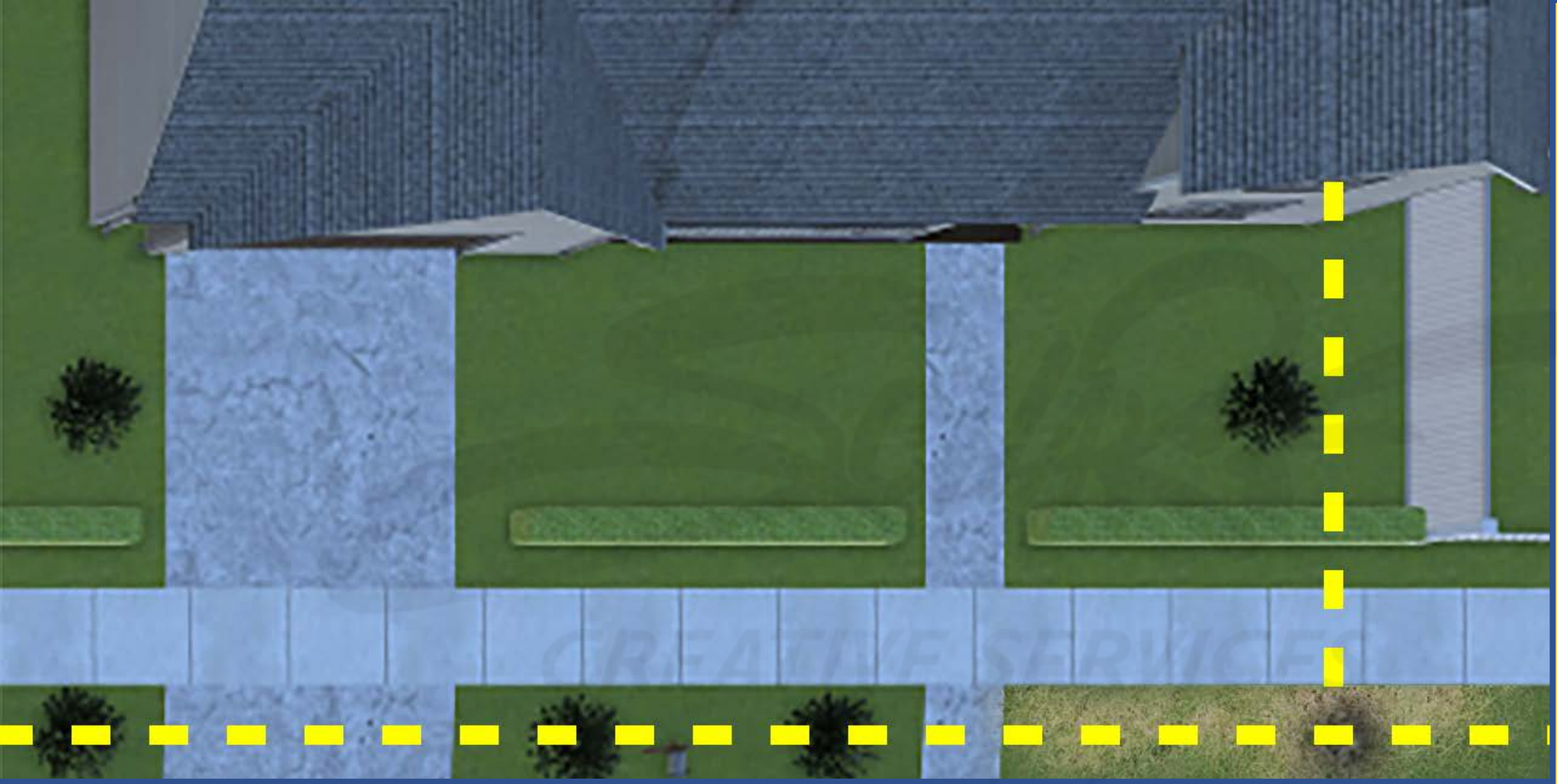

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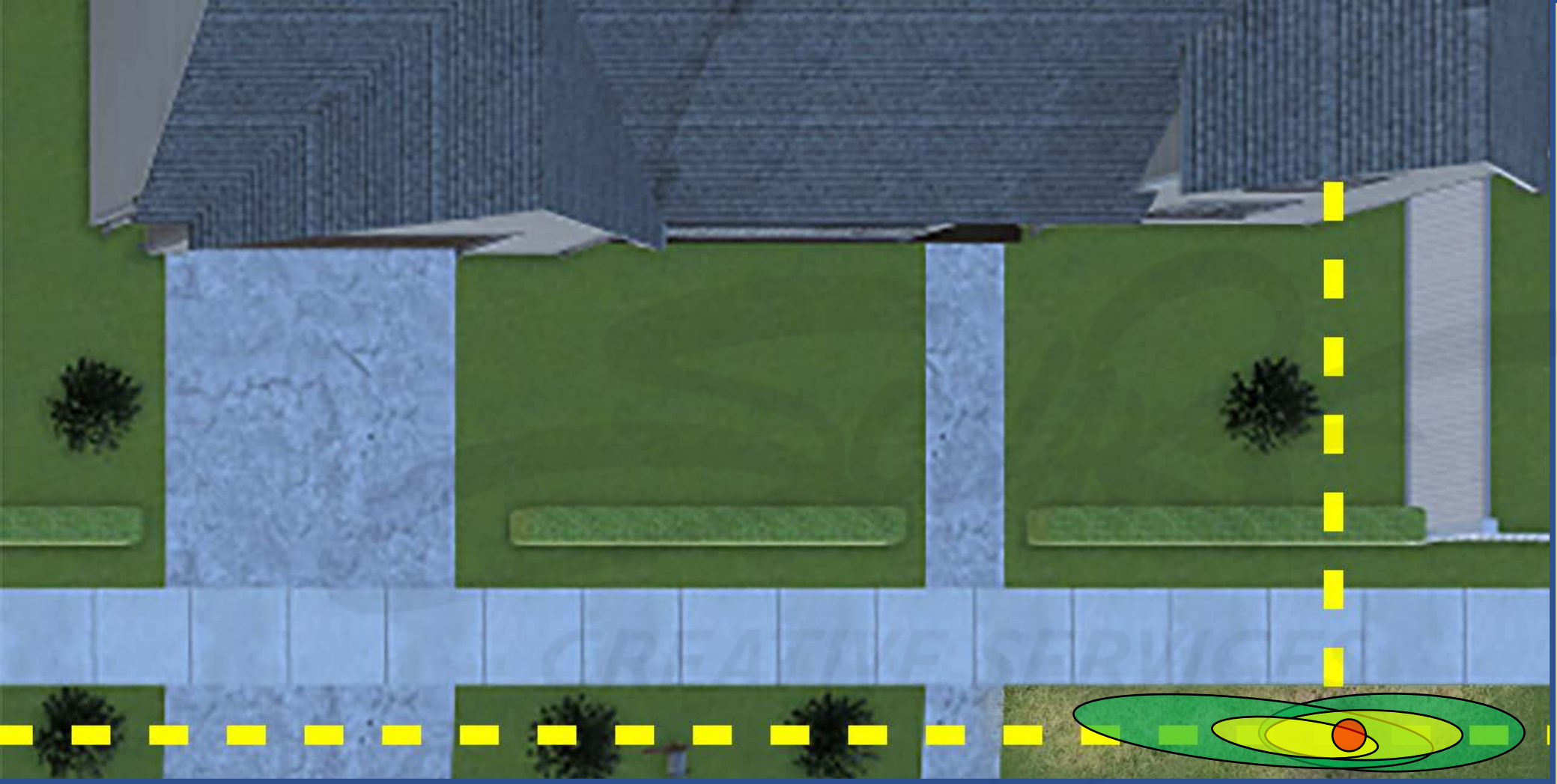

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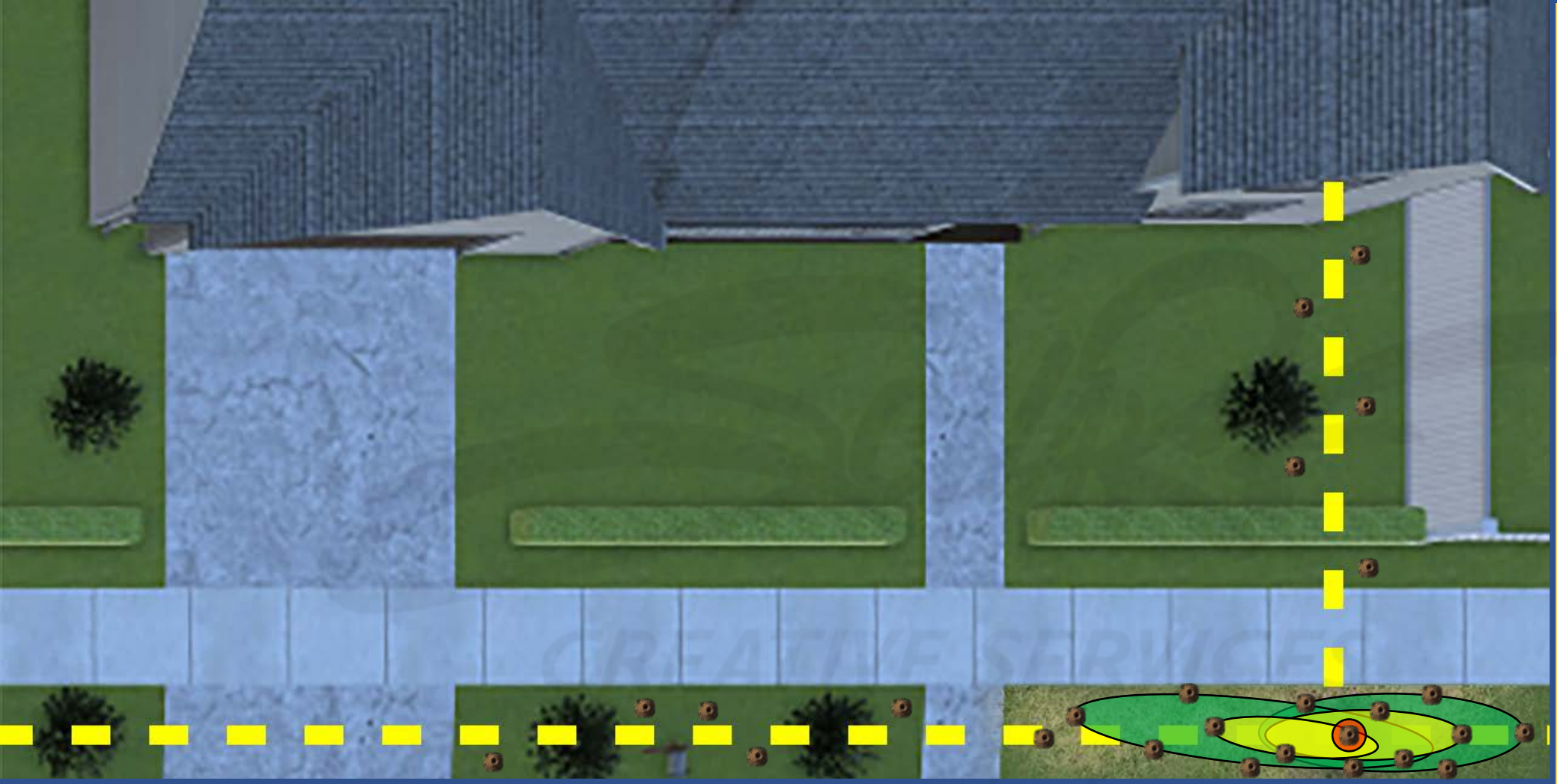

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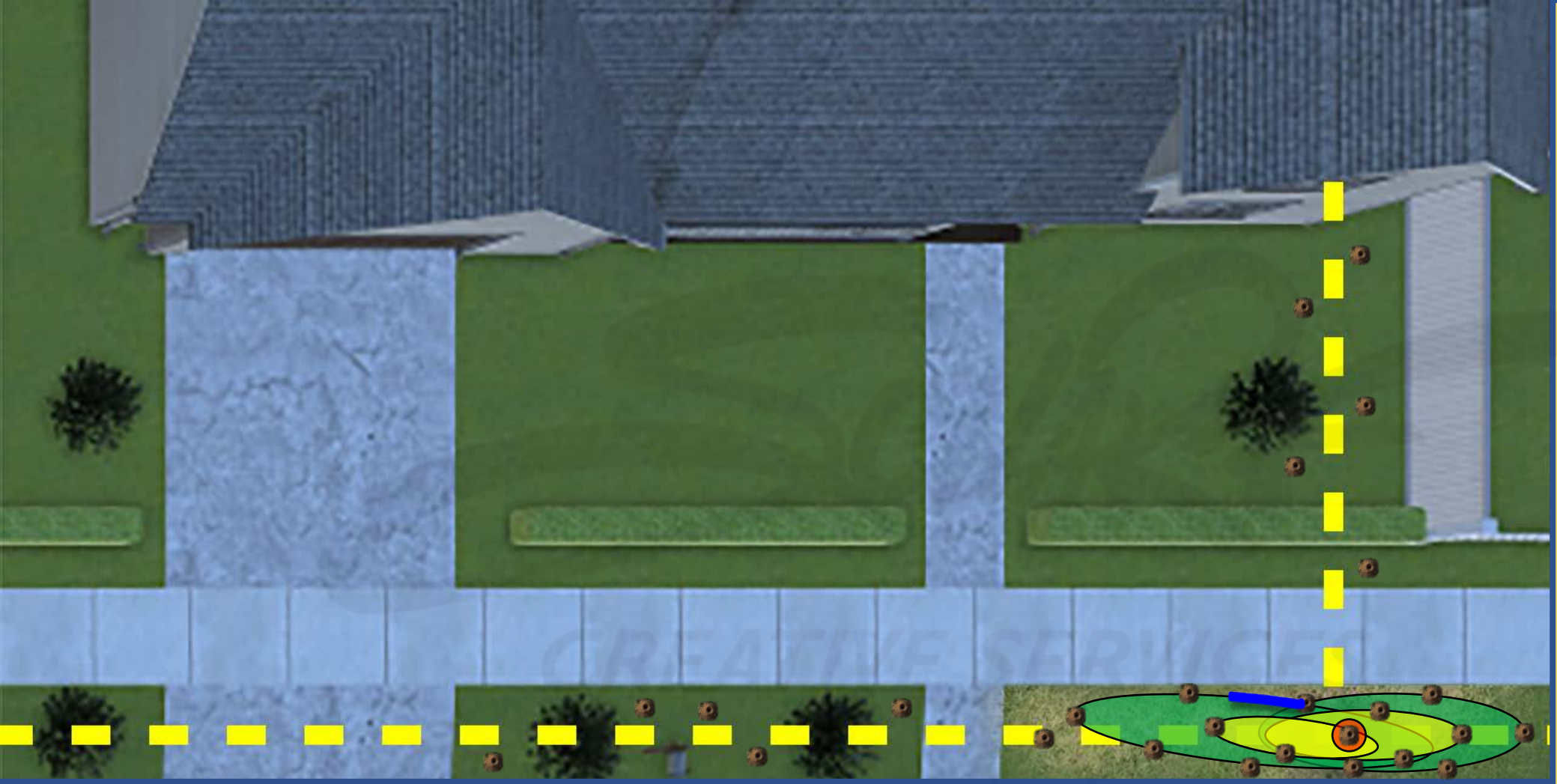

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Carefully read the description and review the visual aids.

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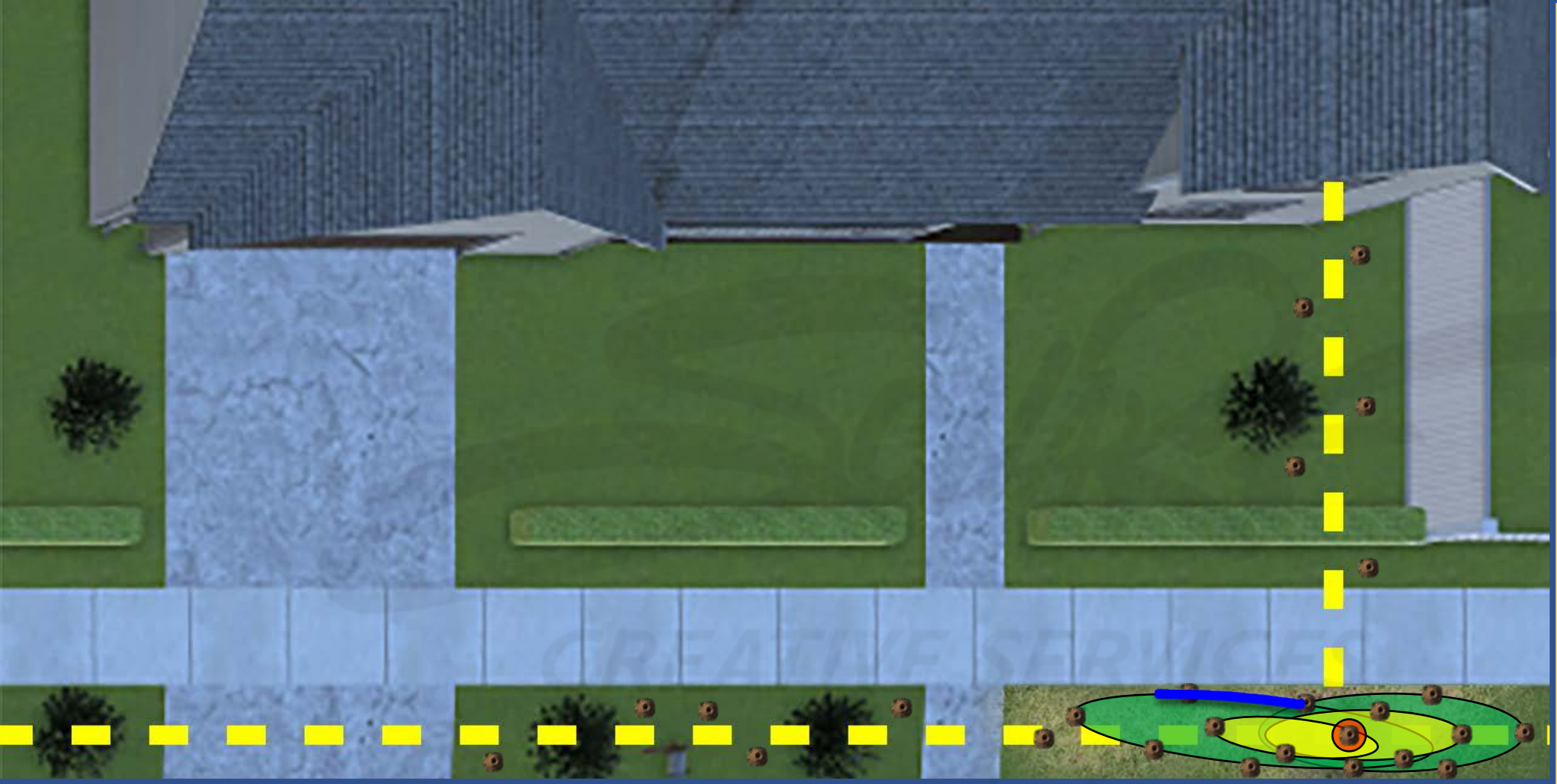

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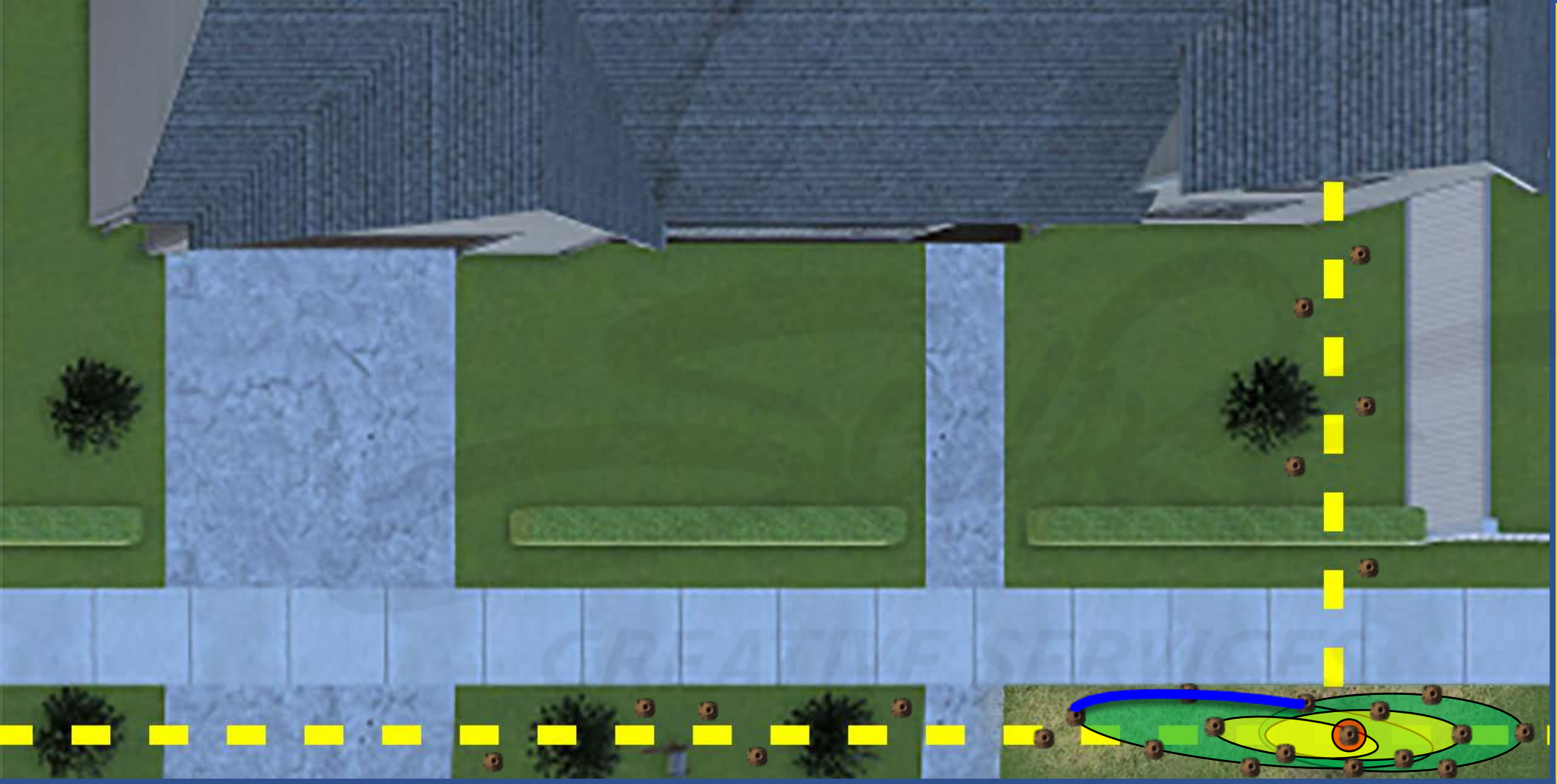

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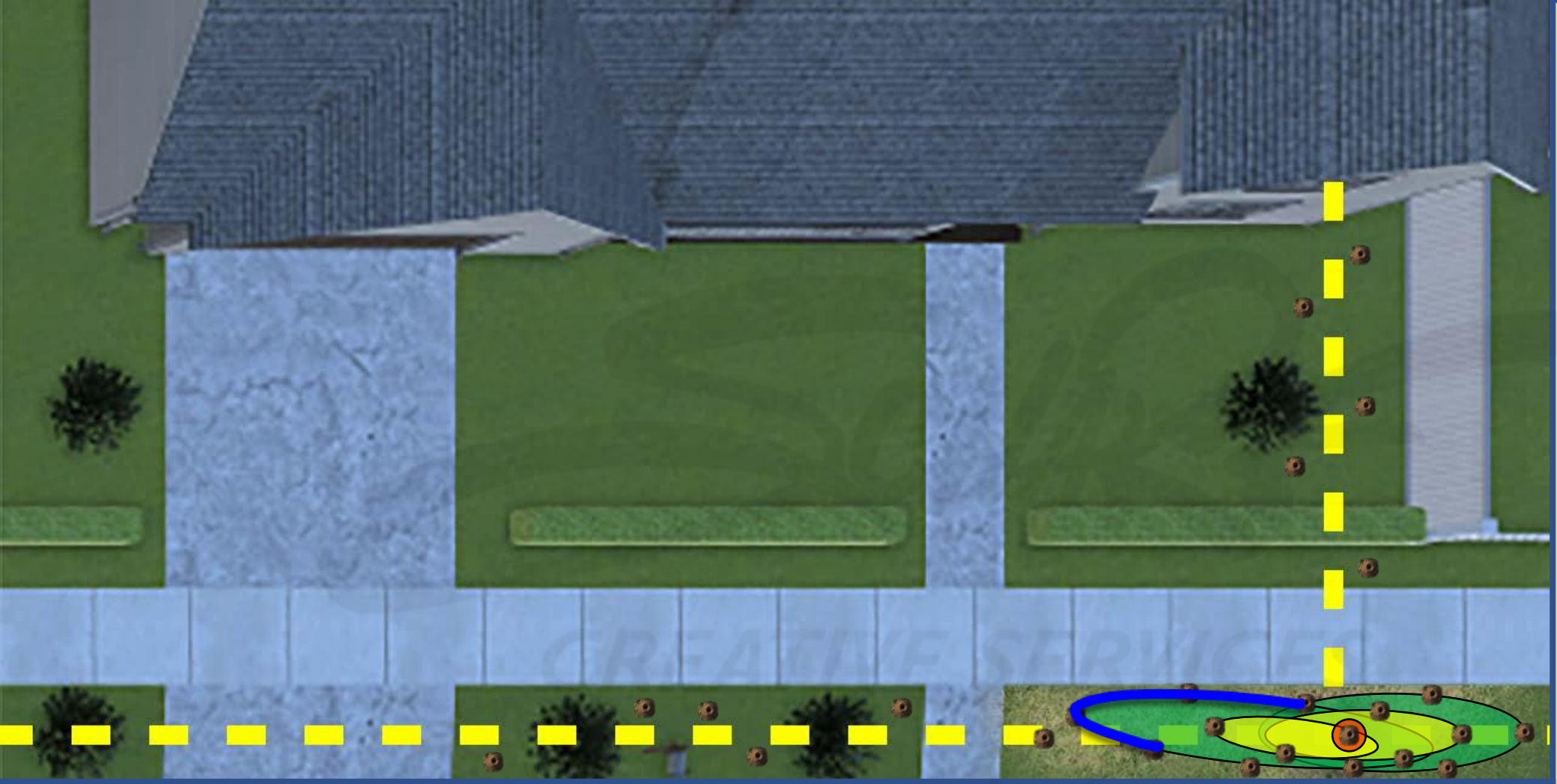

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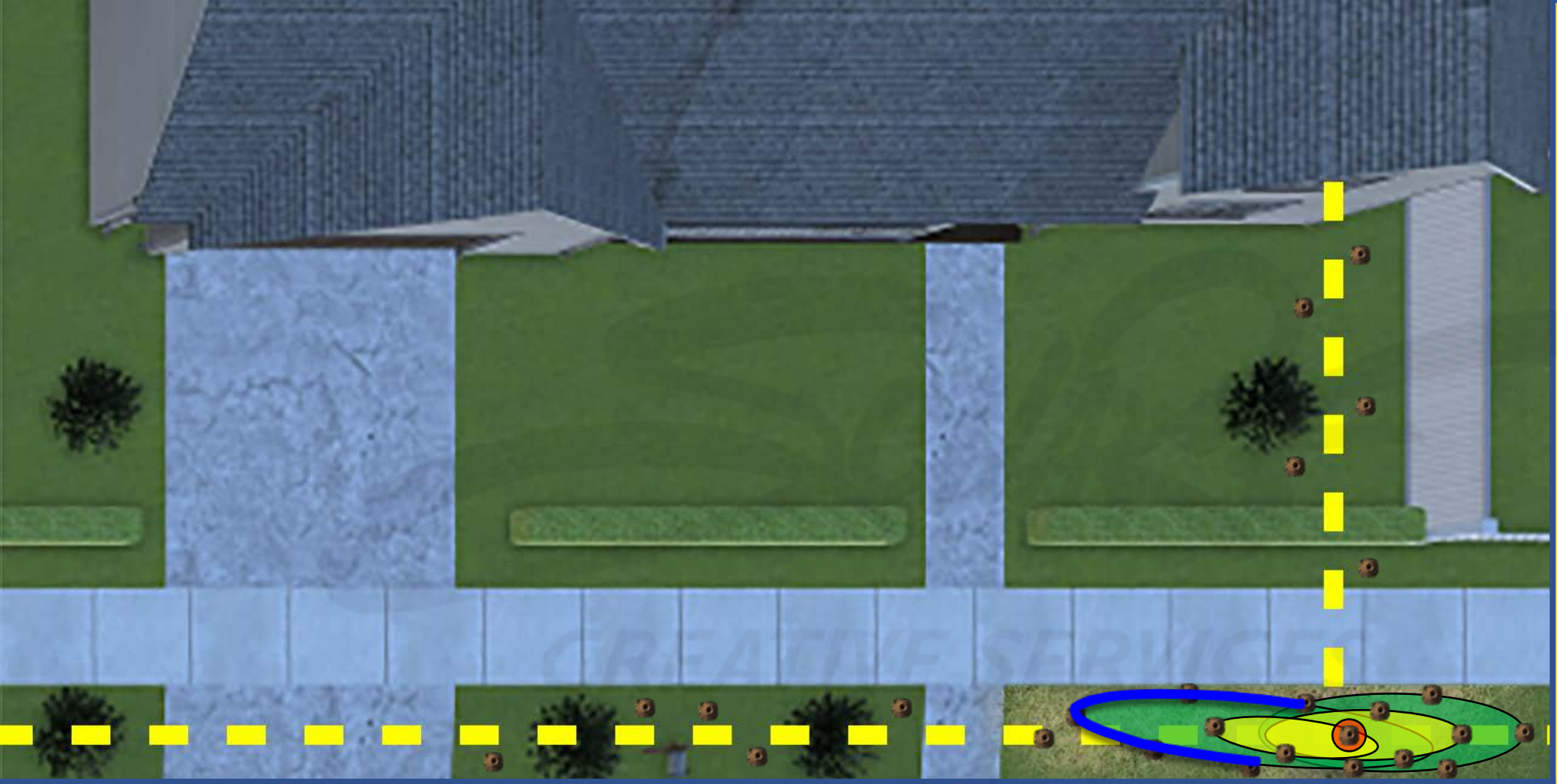

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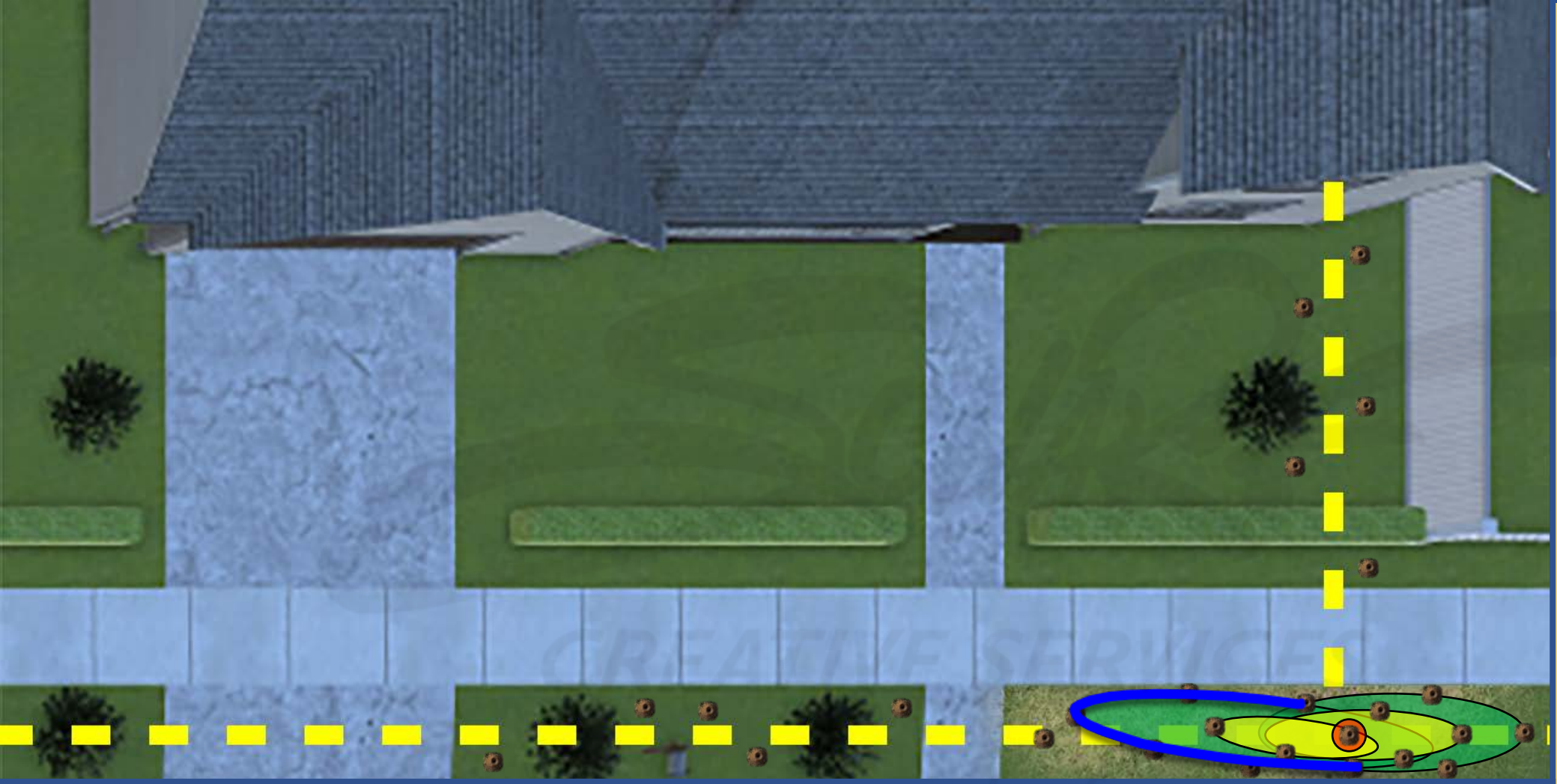

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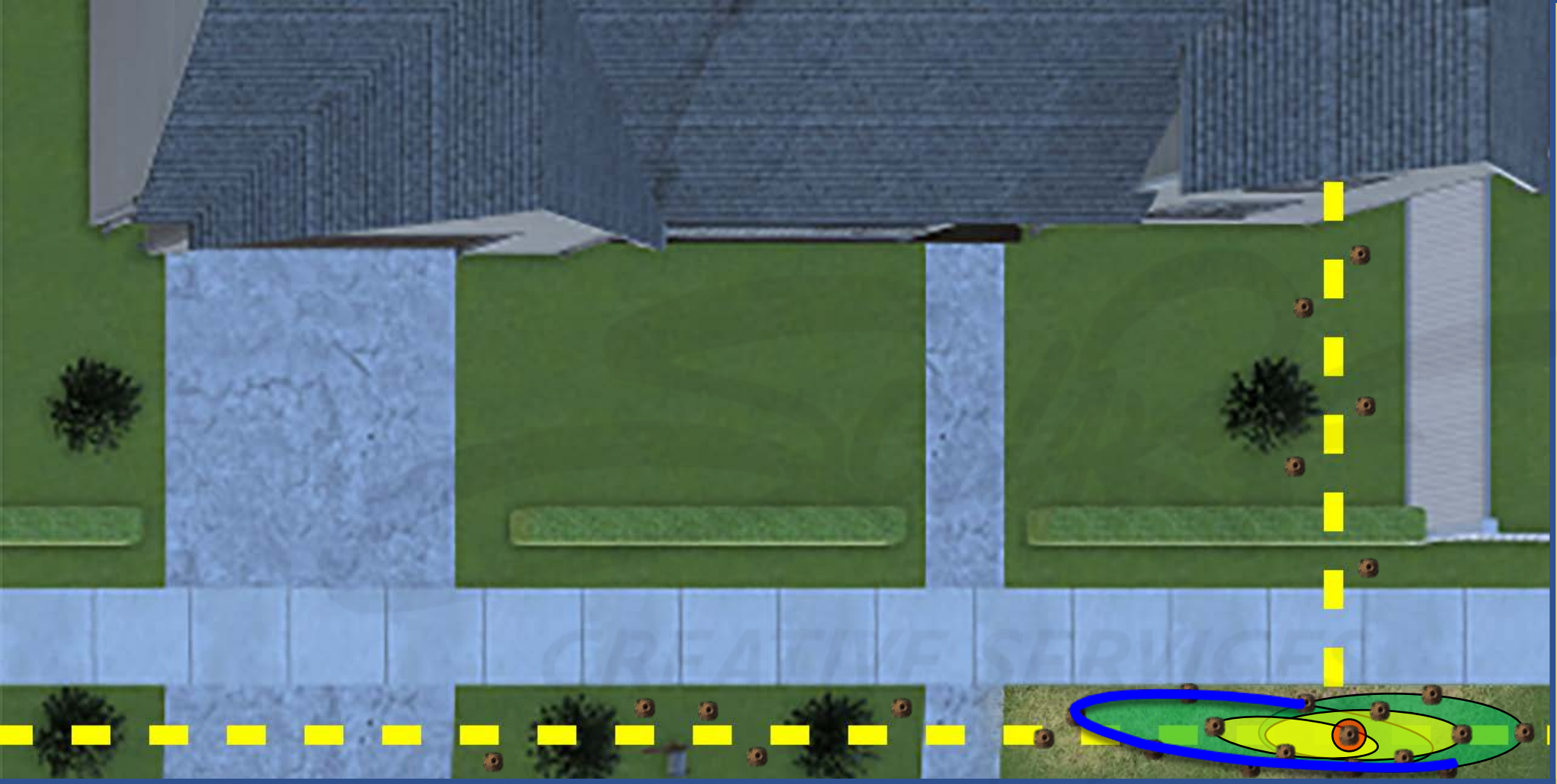

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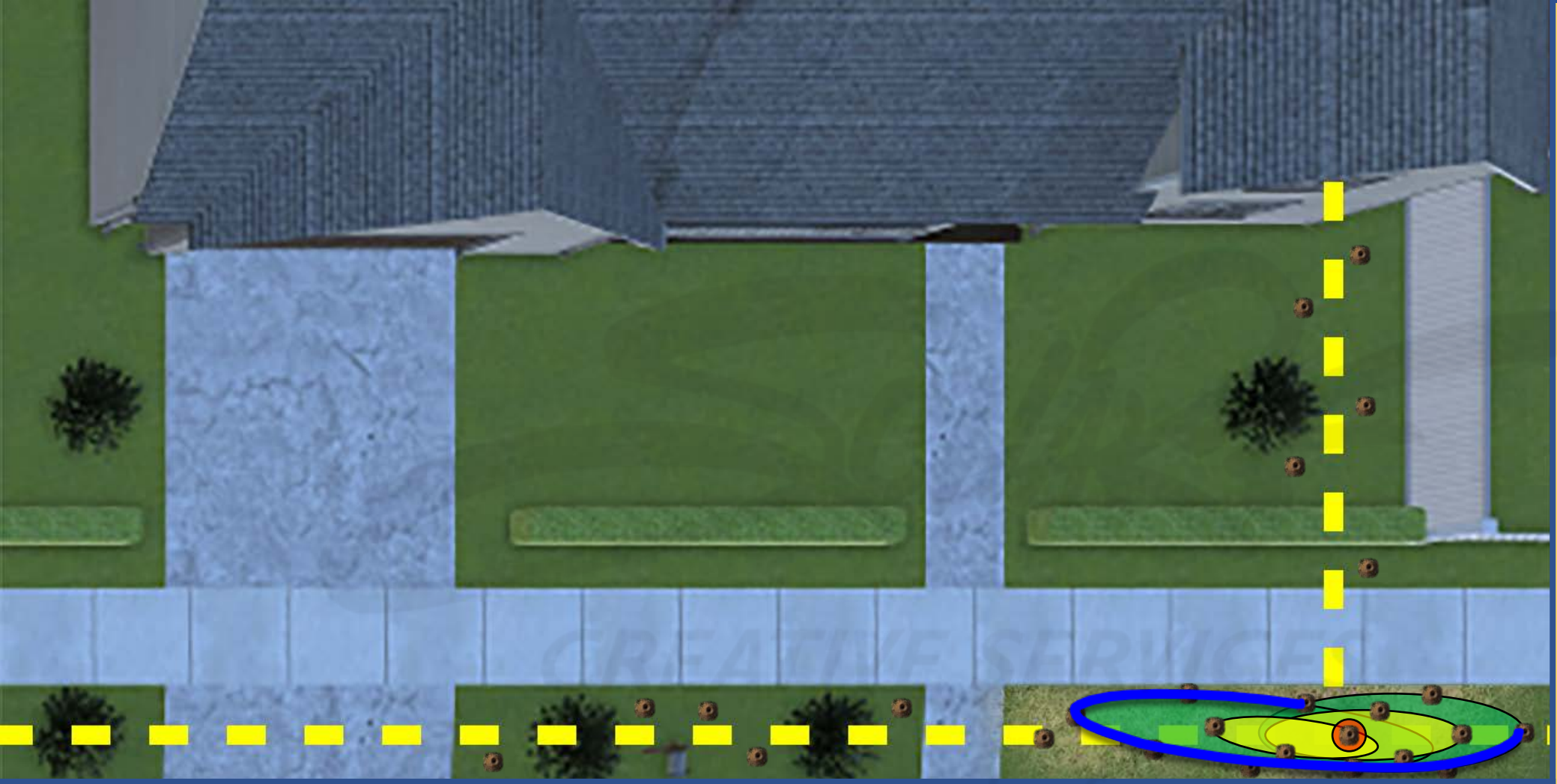

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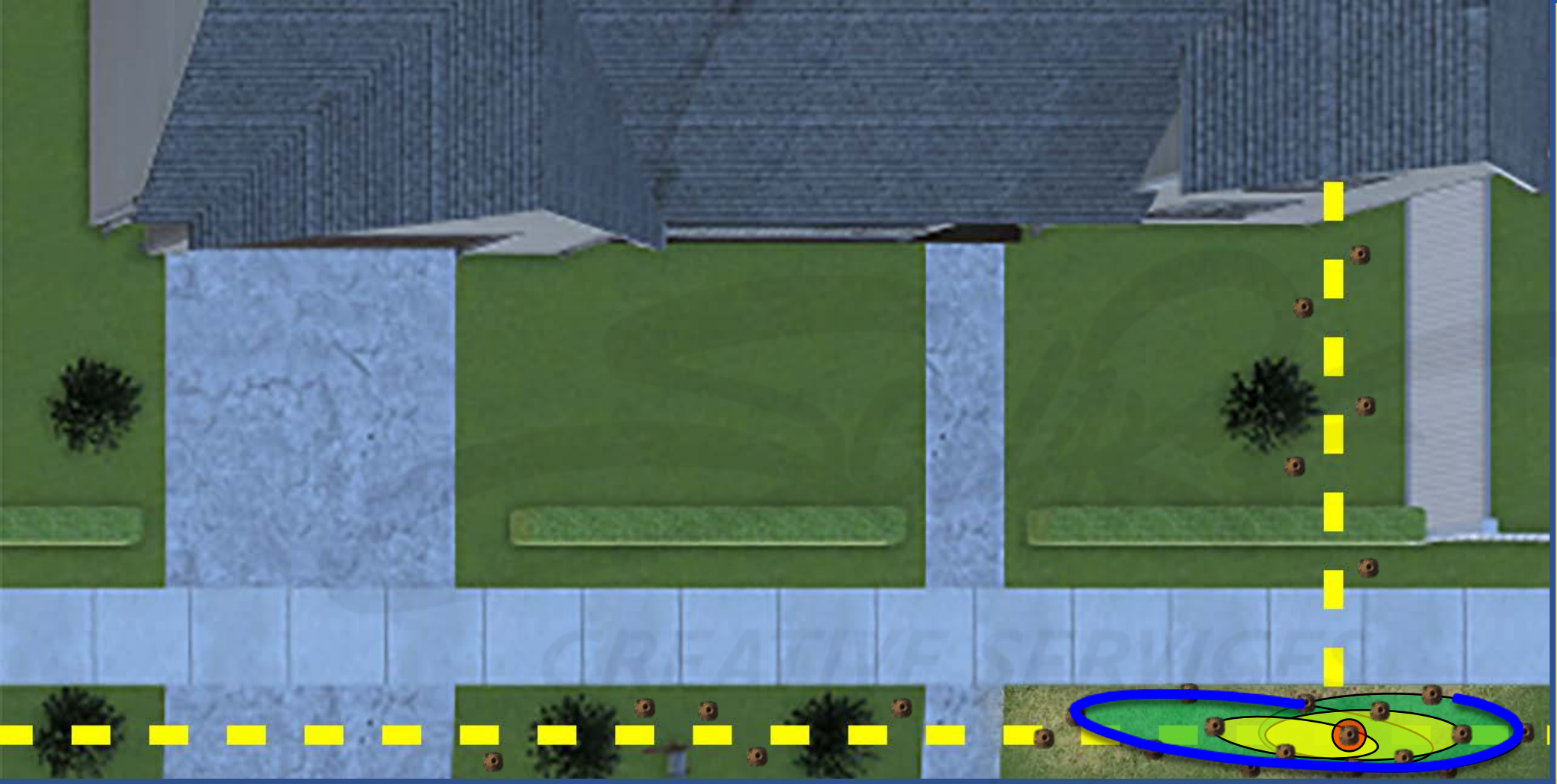

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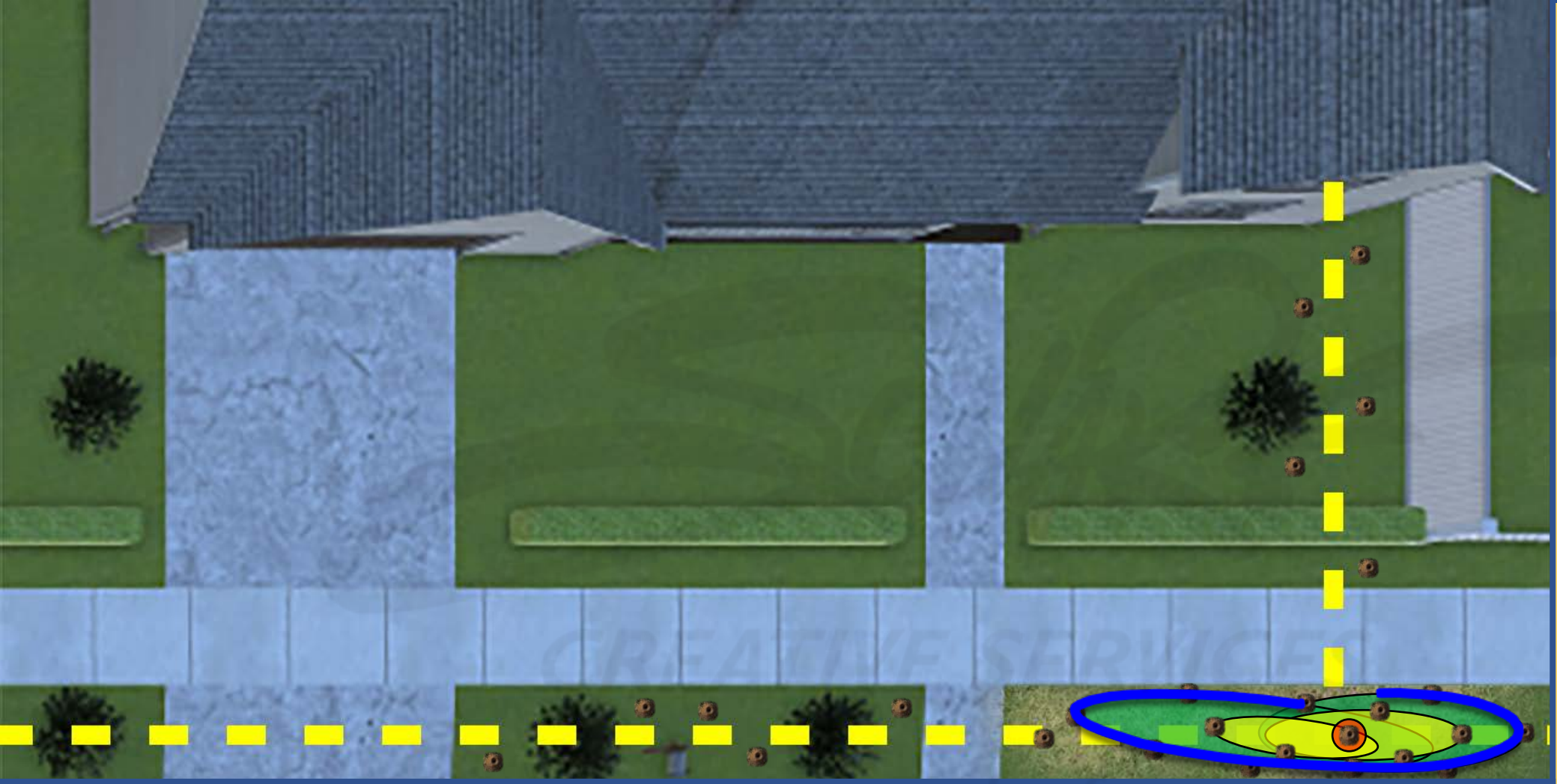

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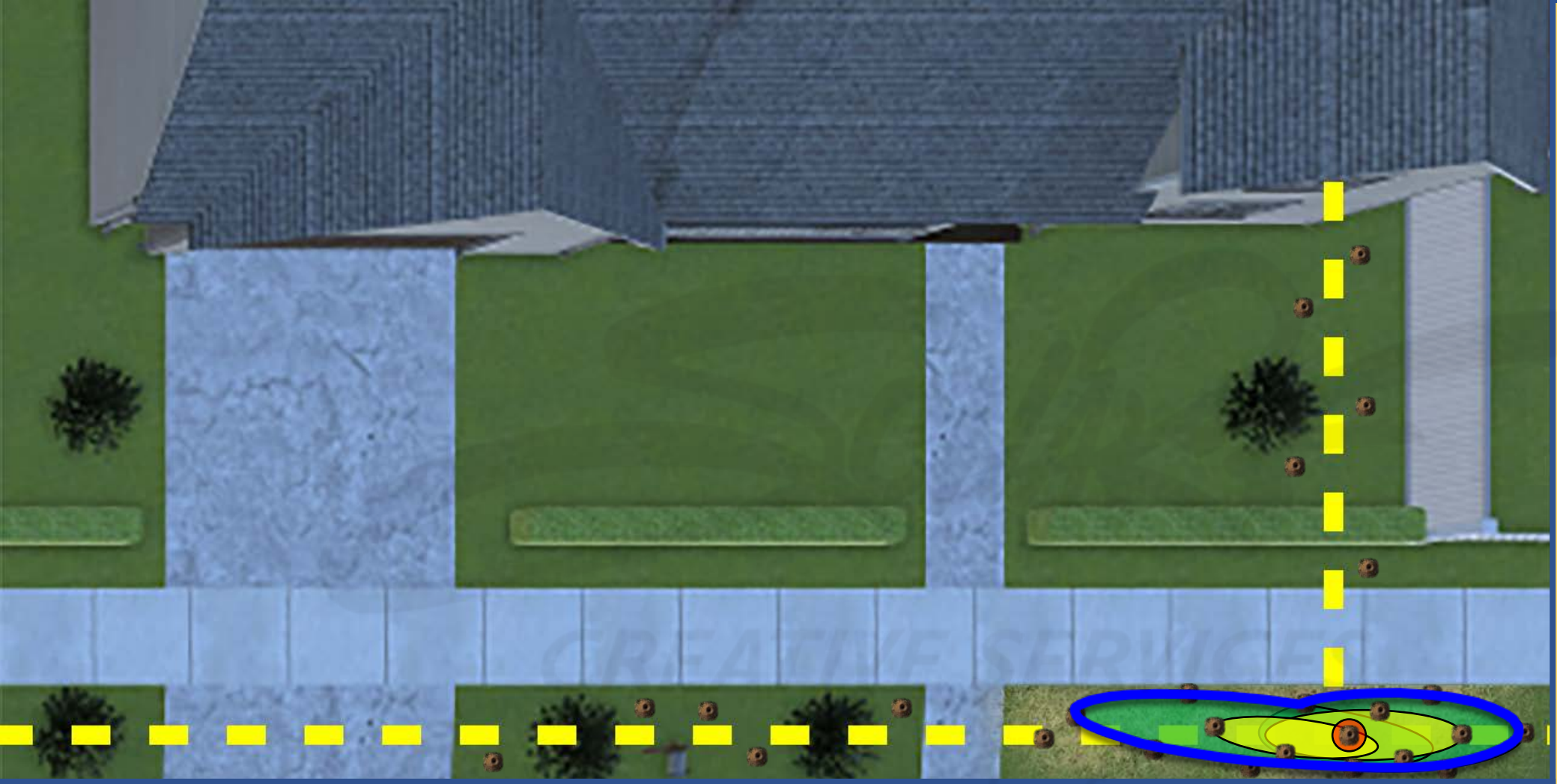

***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 11 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 11 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

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The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

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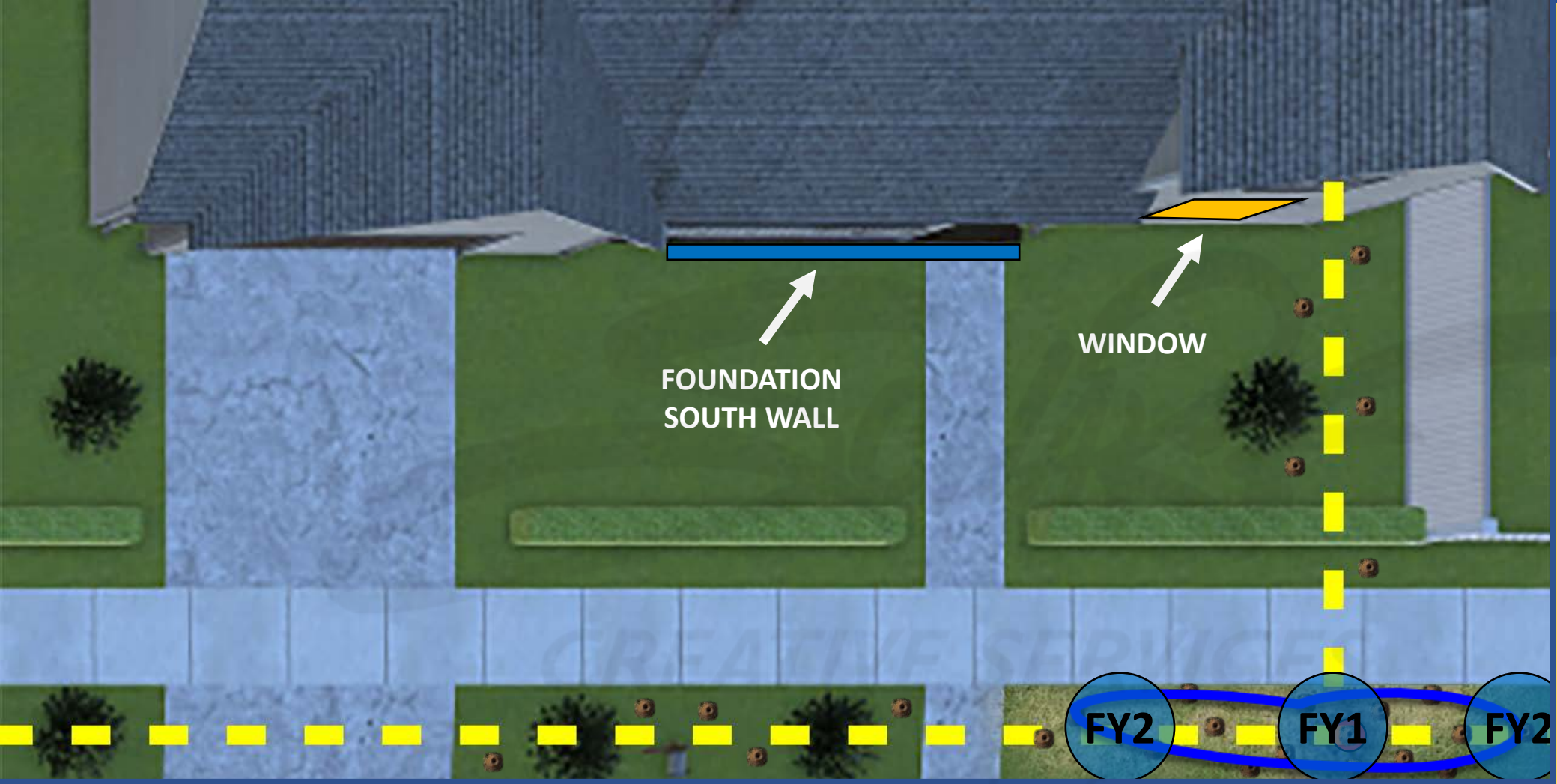


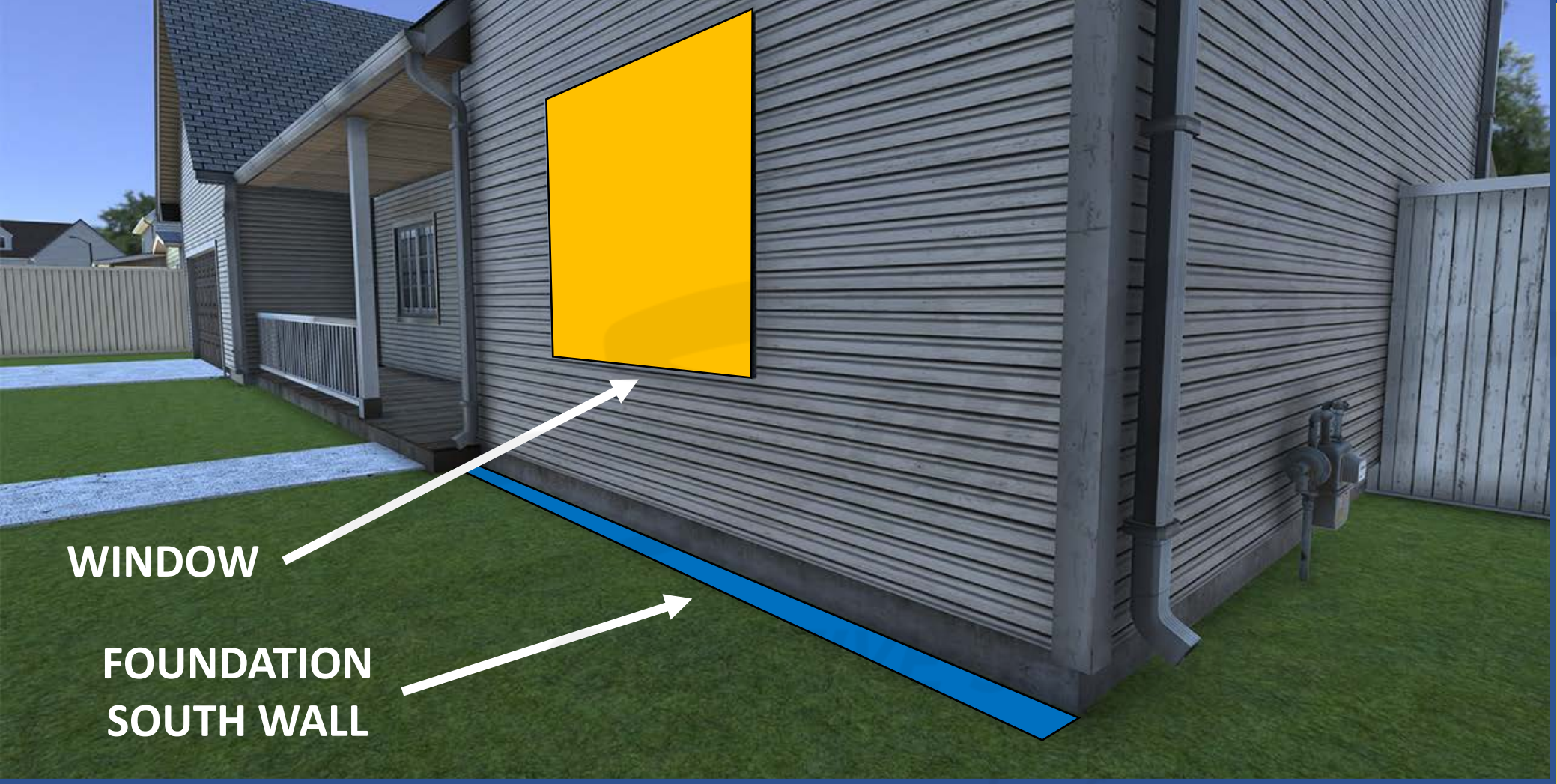
***DESCRIPTION**: Upon successfully locating the leak, the user is required to perform a LEAK SURVEY. This scenario requires utilization of the SENSIT CGI or SENSIT LZ30 to investigate the perimeter, involving one LEAK SURVEY – FOUNDATION PORCH collision volume, one LEAK SURVEY – WINDOW collision volume, and three LEAK SURVEY GAS LINE collision volumes (one LEAK SURVEY - SERVICE LINE TO MAIN collision volume and two LEAK SURVEY - UPSTREAM OF MAIN collision volumes, each of which must be spaced 25 FEET away from the LEAK SURVEY – SERVICE LINE TO MAIN collision volume).*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



***DESCRIPTION**: Upon successfully locating the leak, the user is required to perform a LEAK SURVEY. This scenario requires utilization of the SENSIT CGI or SENSIT LZ30 to investigate the perimeter, involving one LEAK SURVEY – FOUNDATION PORCH collision volume, one LEAK SURVEY – WINDOW collision volume, and three LEAK SURVEY GAS LINE collision volumes (one LEAK SURVEY - SERVICE LINE TO MAIN collision volume and two LEAK SURVEY - UPSTREAM OF MAIN collision volumes, each of which must be spaced 25 FEET away from the LEAK SURVEY – SERVICE LINE TO MAIN collision volume).*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

Scenario 2

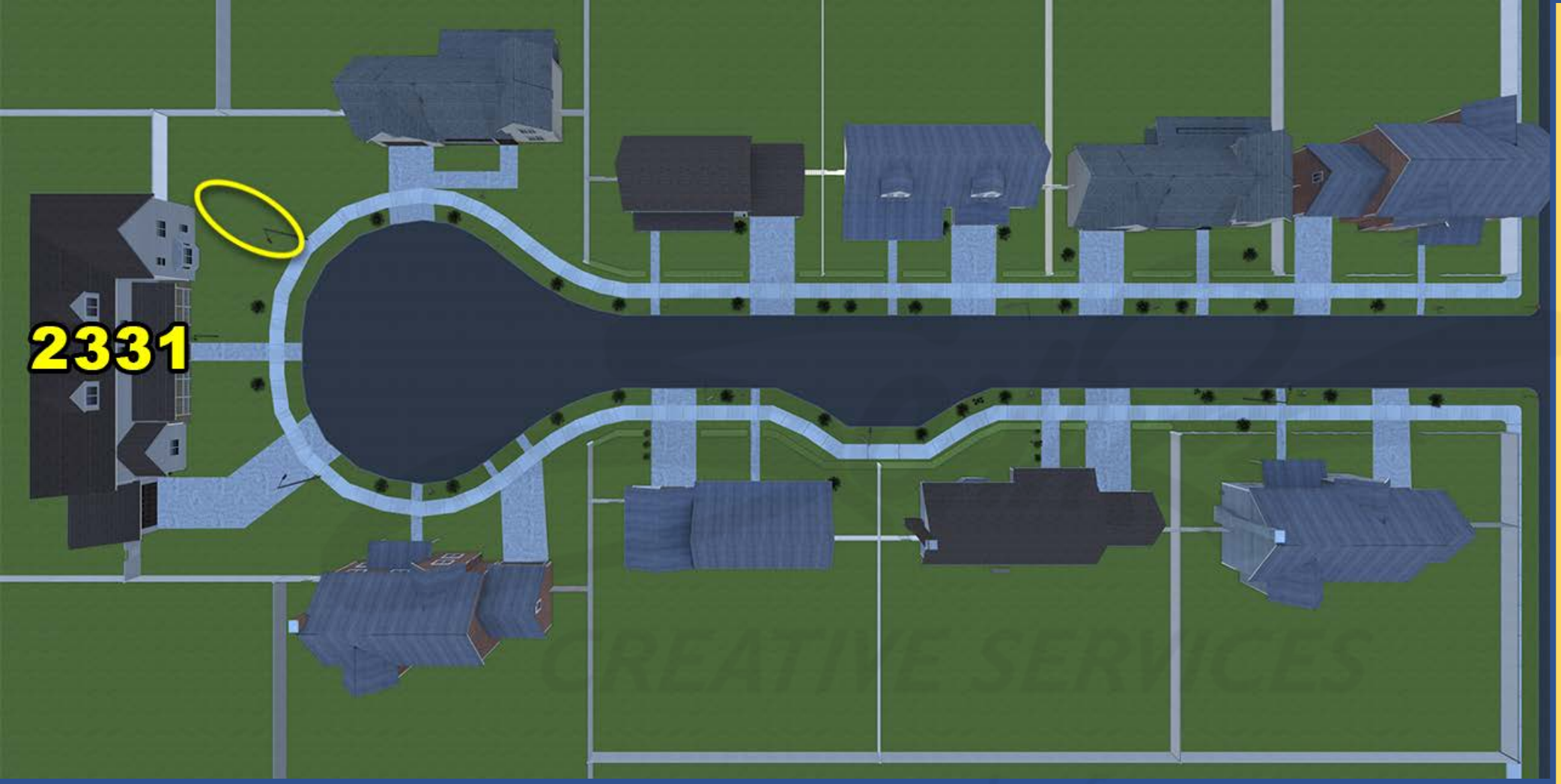
House at 2331 – Front Yard

- Medium-sized leak at gas line tee under light post.
- No readings at gas meter riser.
- No customer evacuation.

***DESCRIPTION**: The outside leak for SCENARIO 2 is in the front yard of HOUSE 2331. SLIDES 138-155 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 2. There are to be no visual cues (dying/dead vegetation) at this leak location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The outside leak for SCENARIO 2 is in the front yard of HOUSE 2331. SLIDES 138-155 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 2. There are to be no visual cues (dying/dead vegetation) at this leak location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

SLIDES 138-155 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 2.

***DESCRIPTION**: The outside leak for SCENARIO 2 is in the front yard of HOUSE 2331. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a "confirmation outline" should appear to acknowledge success.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

***DESCRIPTION**: The outside leak for SCENARIO 2 is in the front yard of HOUSE 2331. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a "confirmation outline" should appear to acknowledge success.*

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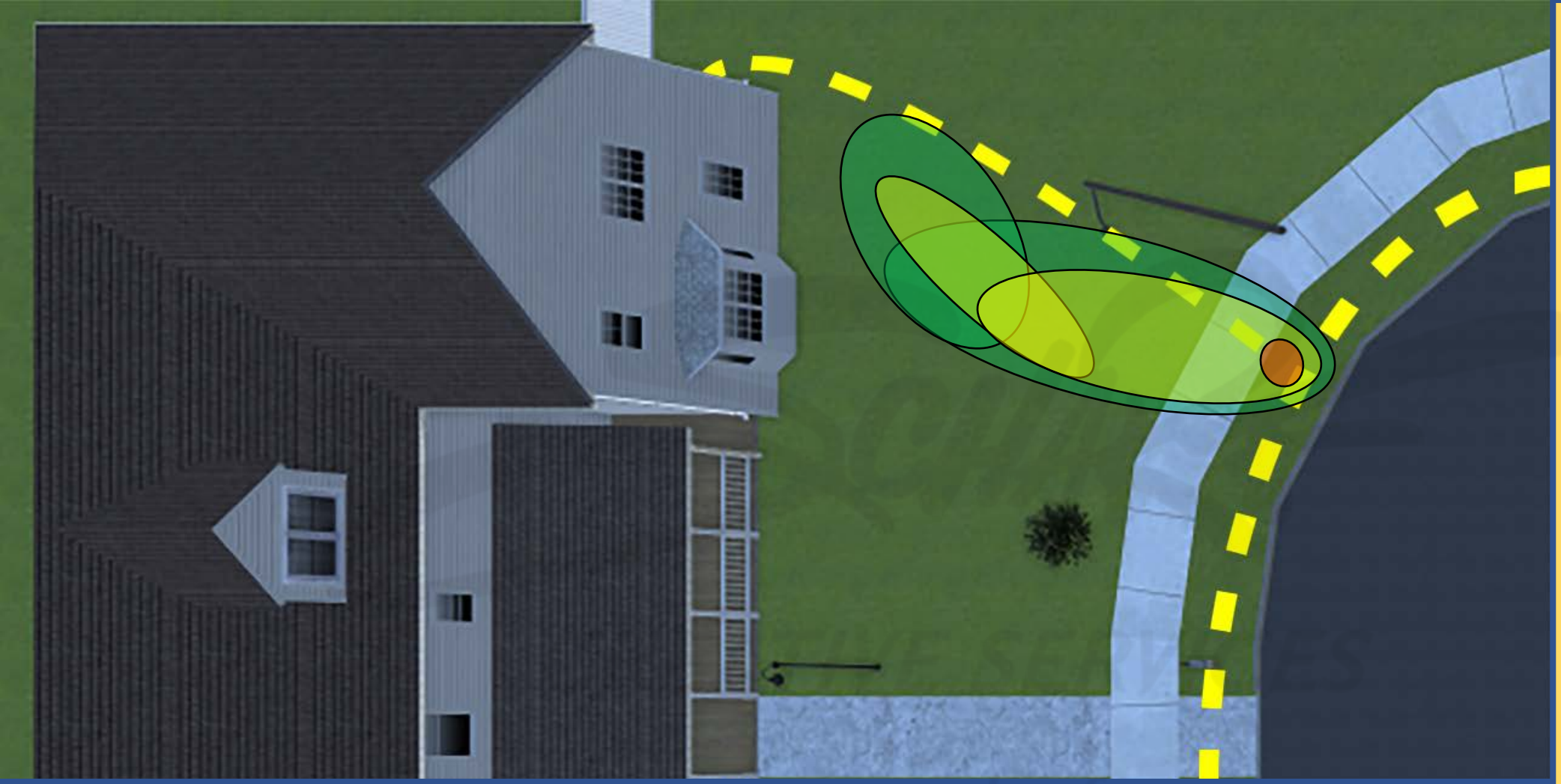

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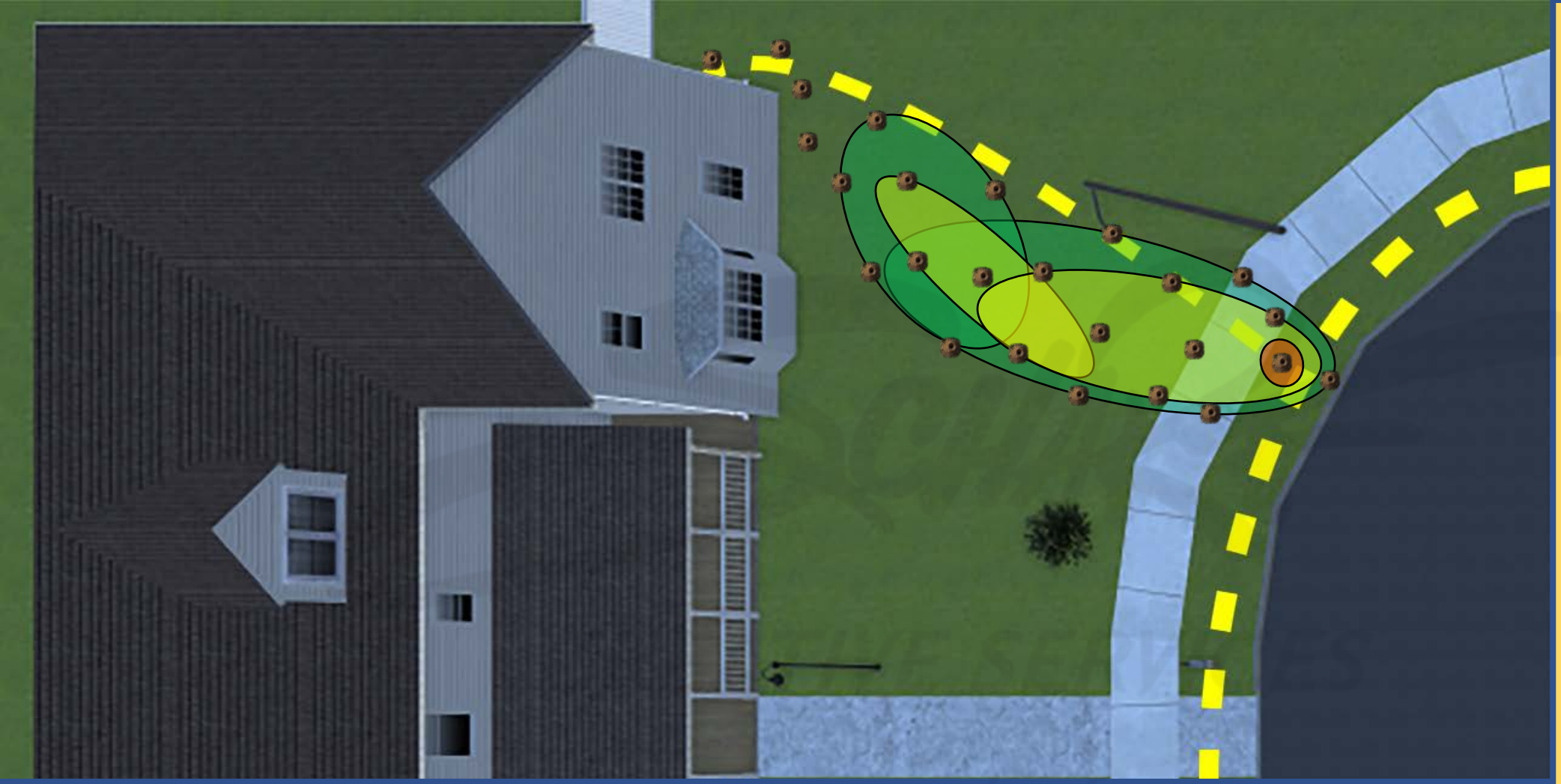

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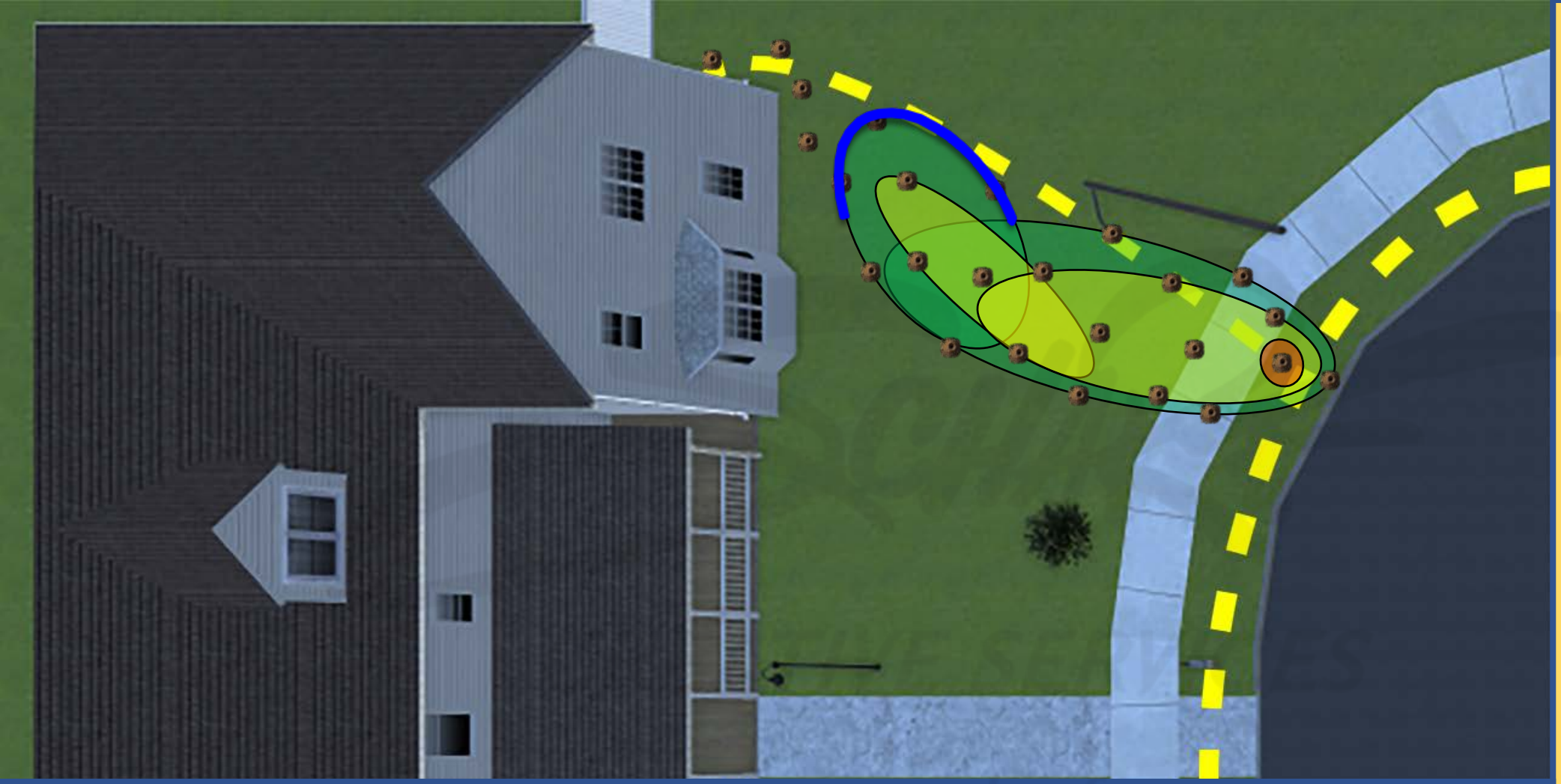

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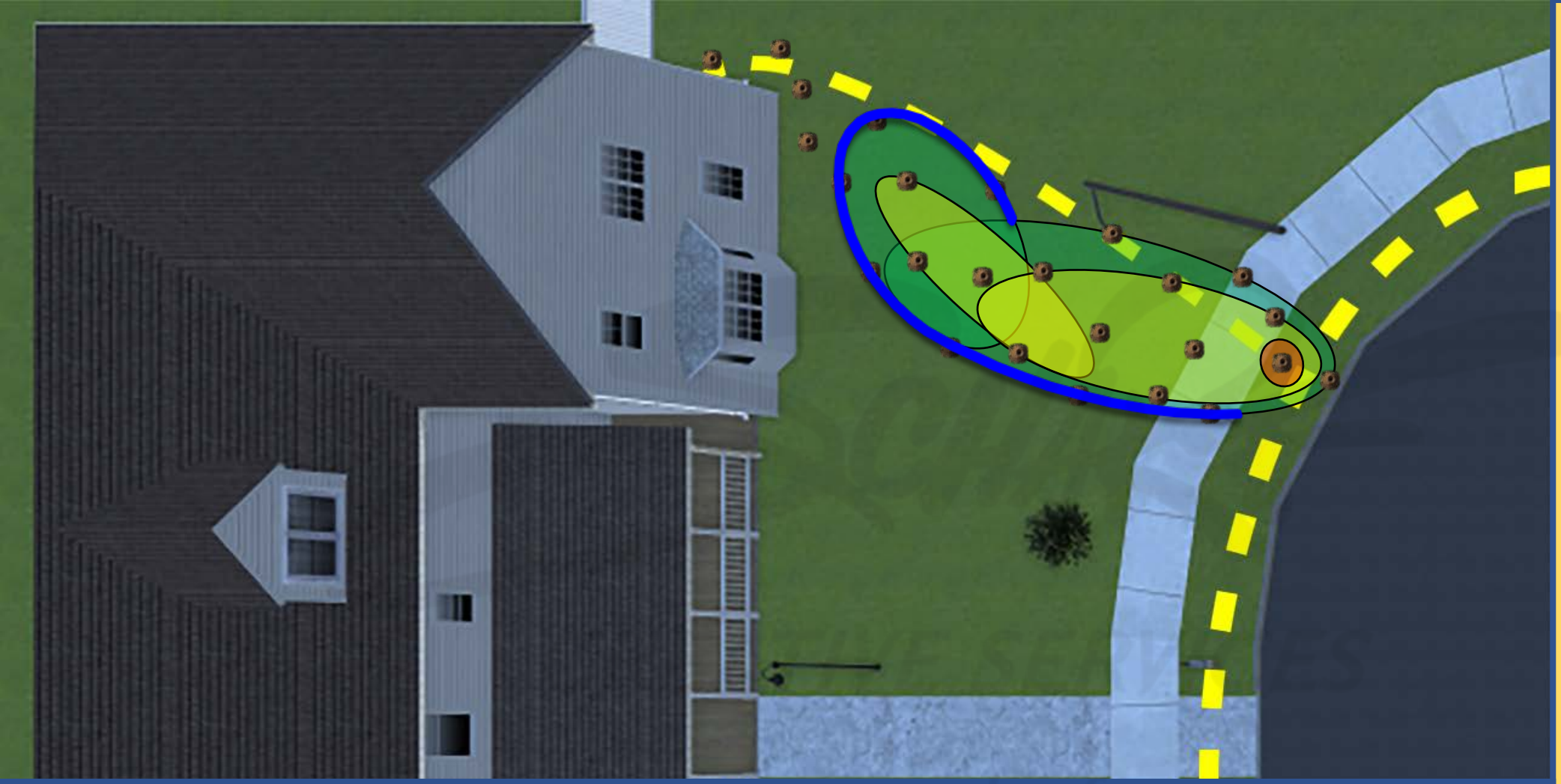

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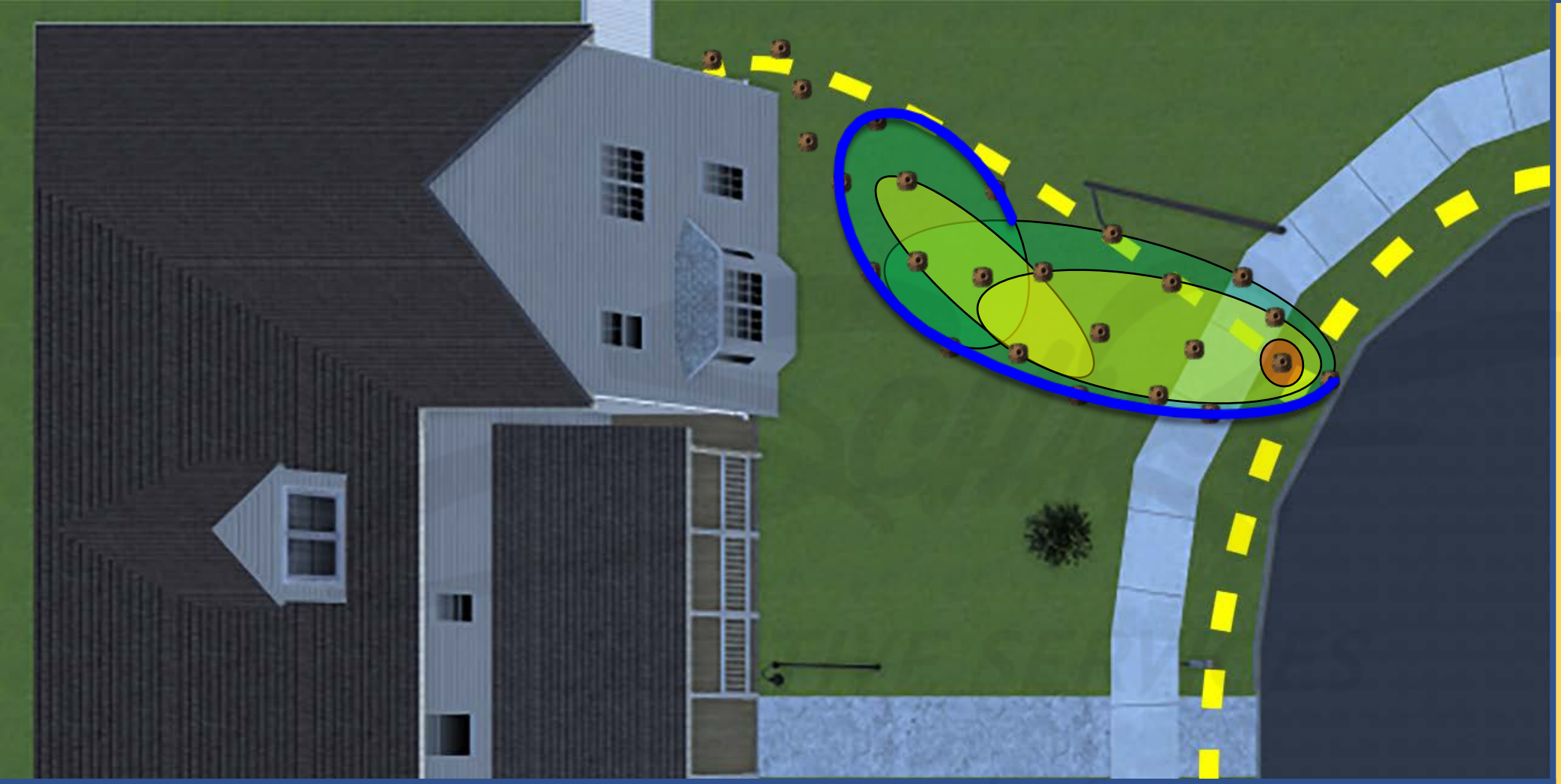

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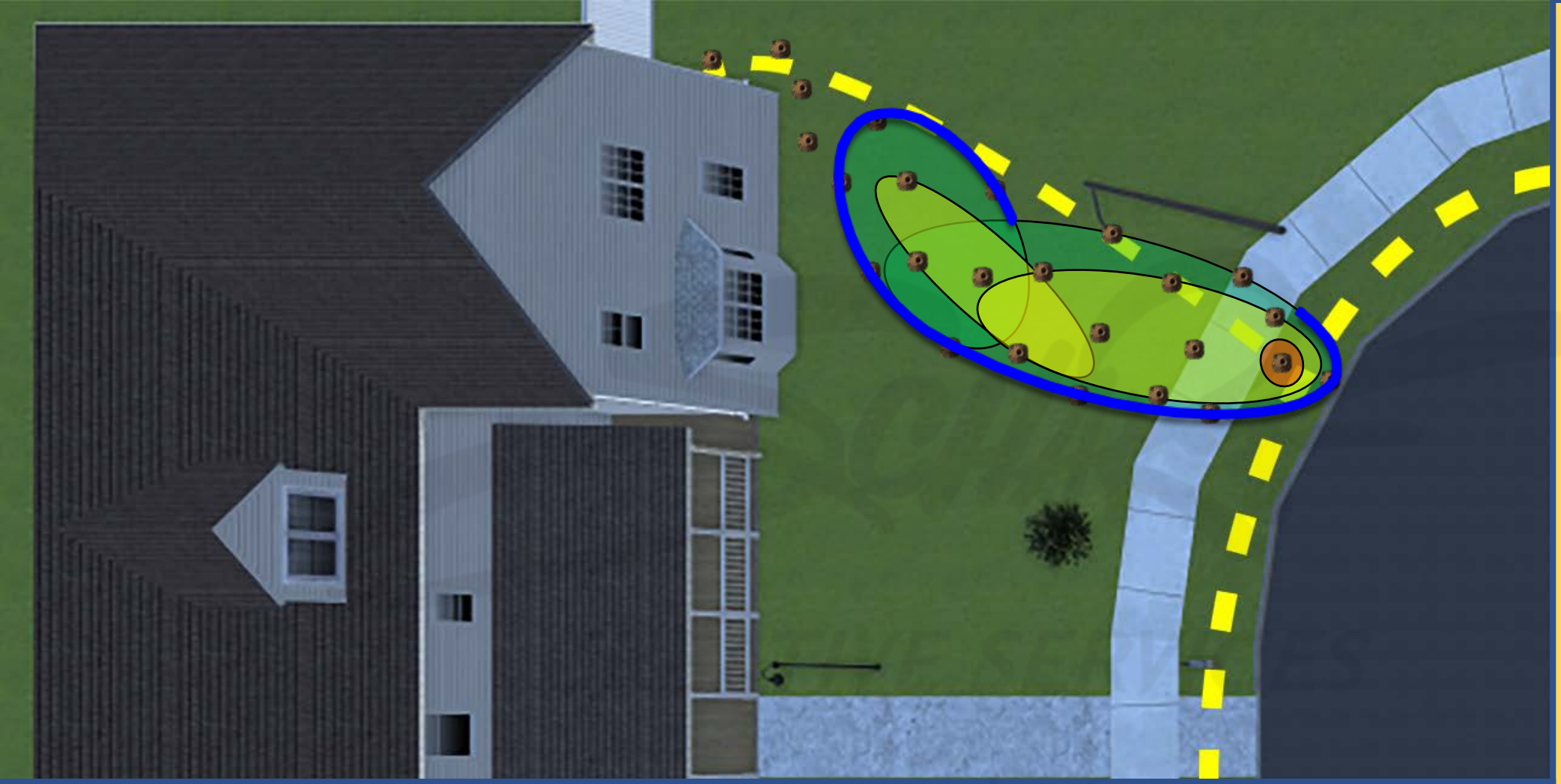

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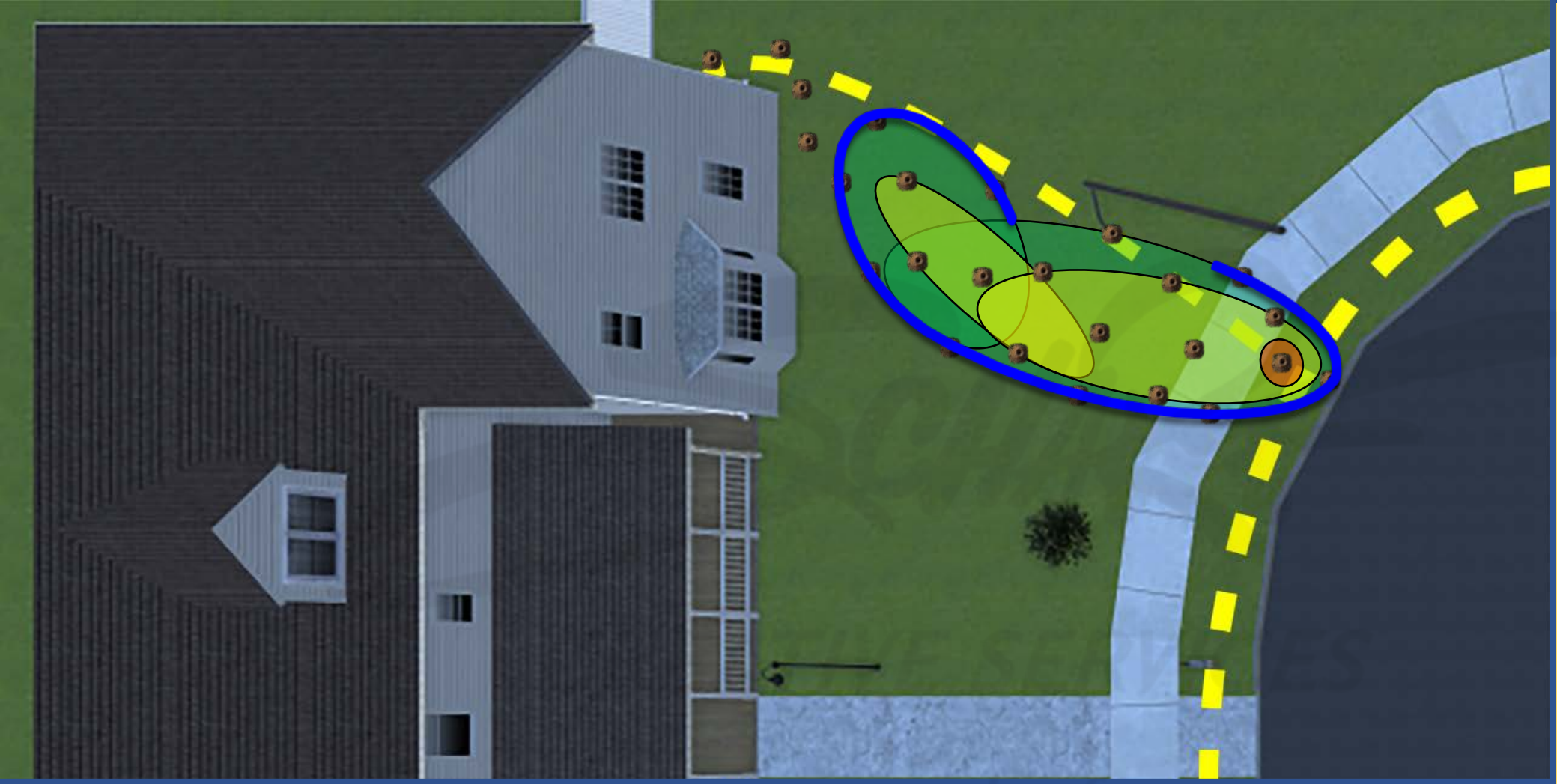

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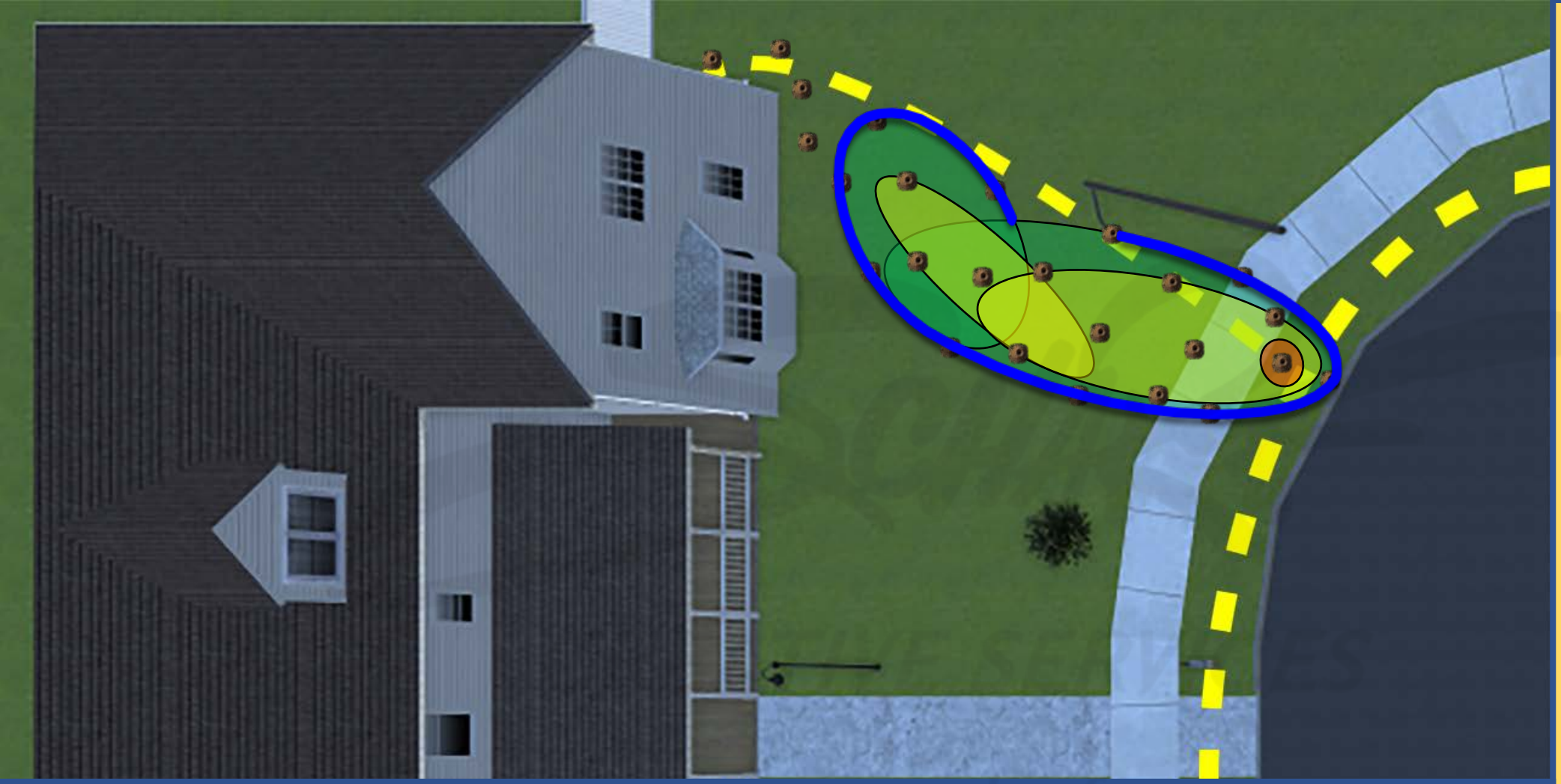

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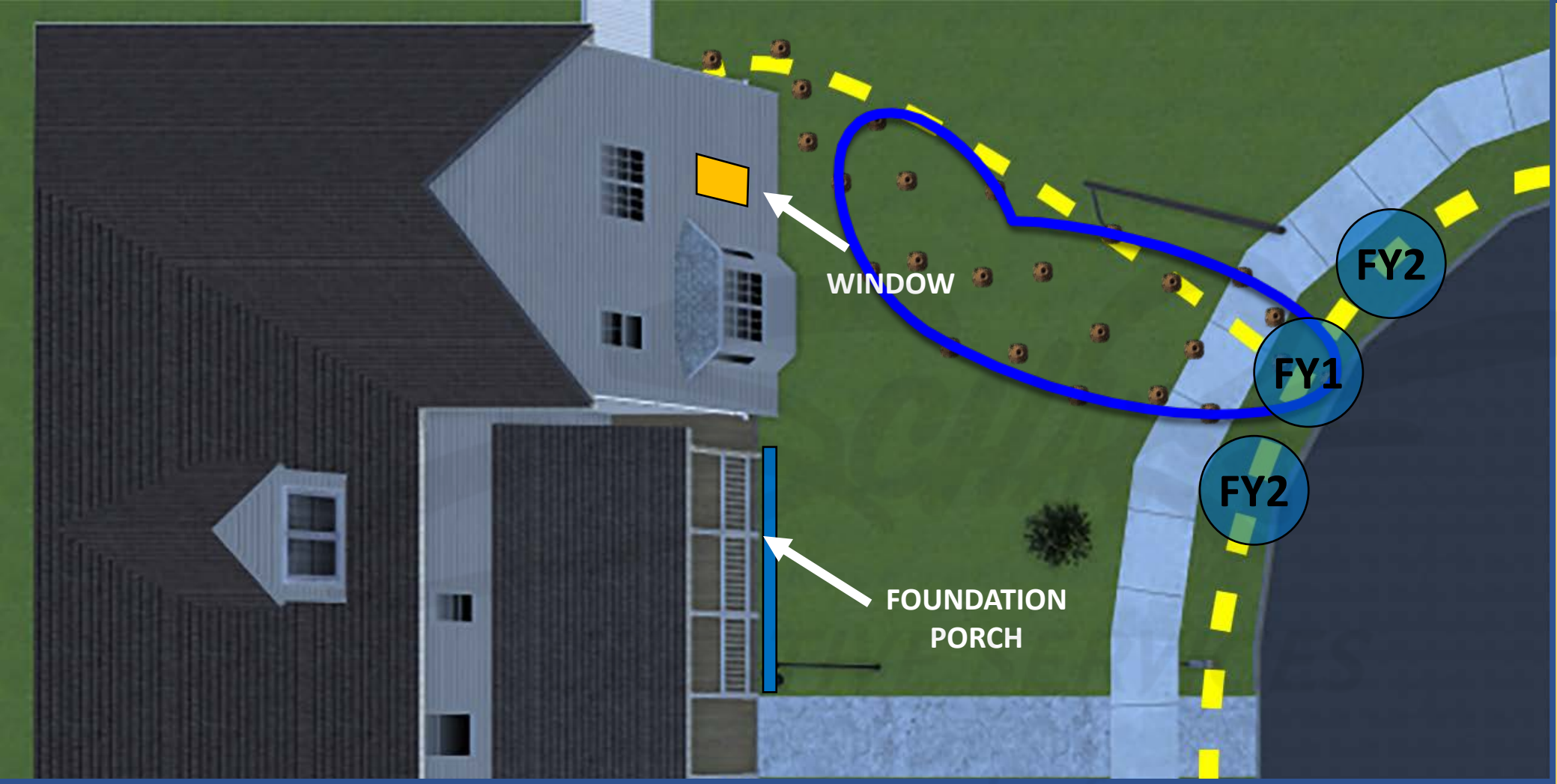

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Scenario 3

House at 2329 – Back Yard

- Low-level readings at gas meter riser from underground leak.
- Evacuate customer from home due to leak near foundation.

***DESCRIPTION**: The outside leak for SCENARIO 3 is located in the southwest corner of the backyard of HOUSE 2329. SLIDES 159-178 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 3. There are to be no visual cues (dying/dead vegetation) at this leak location.*

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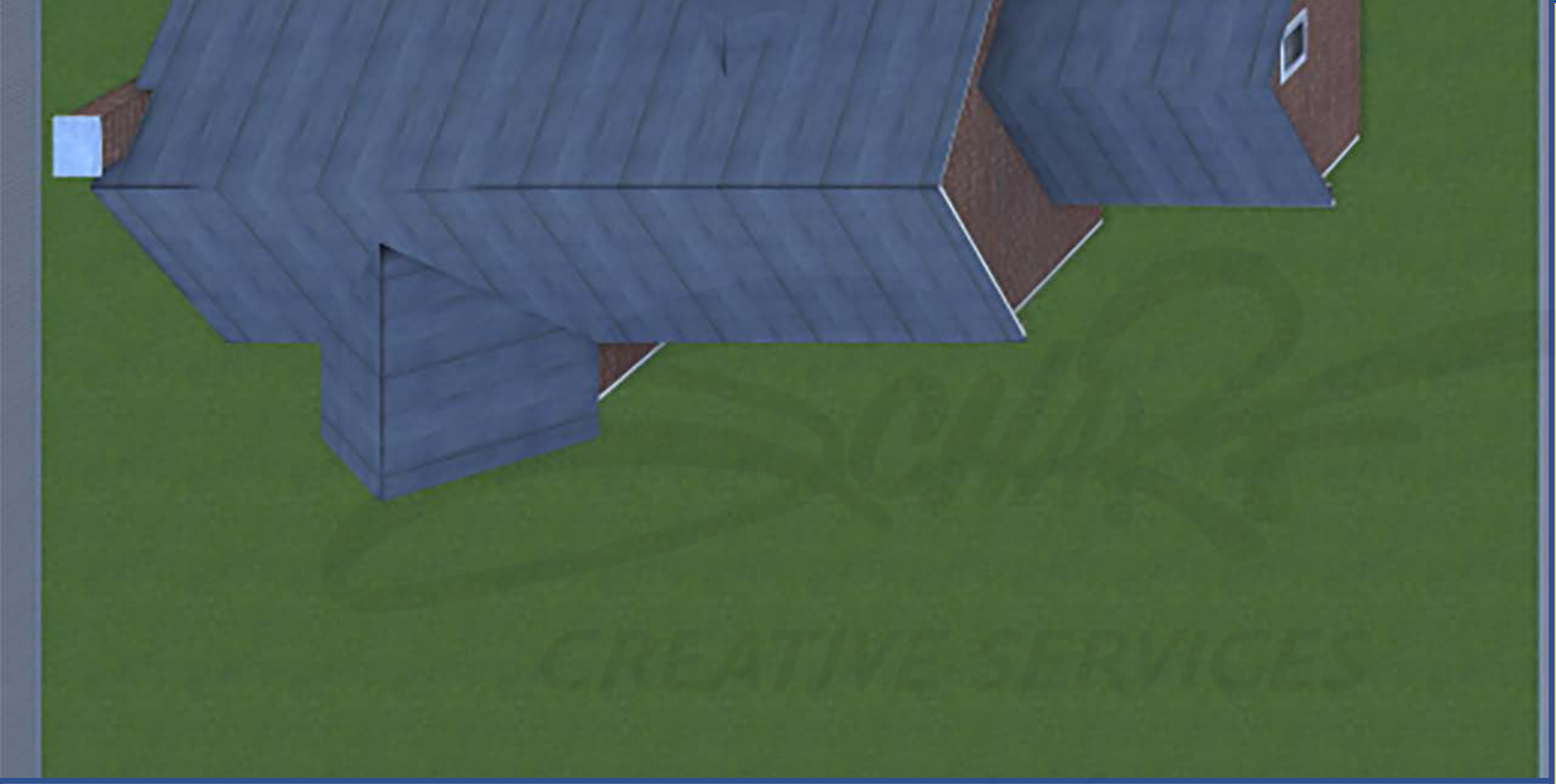

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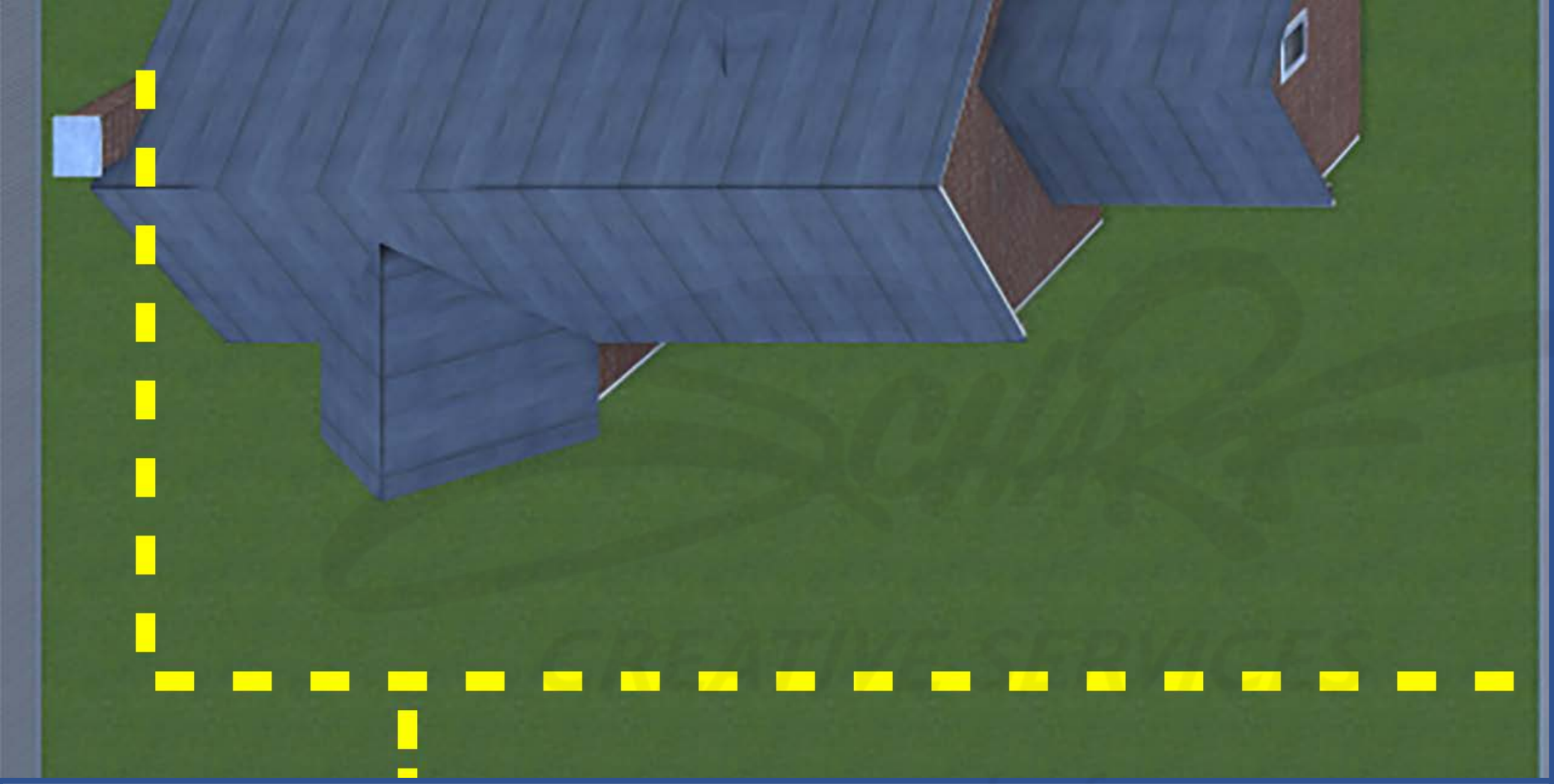

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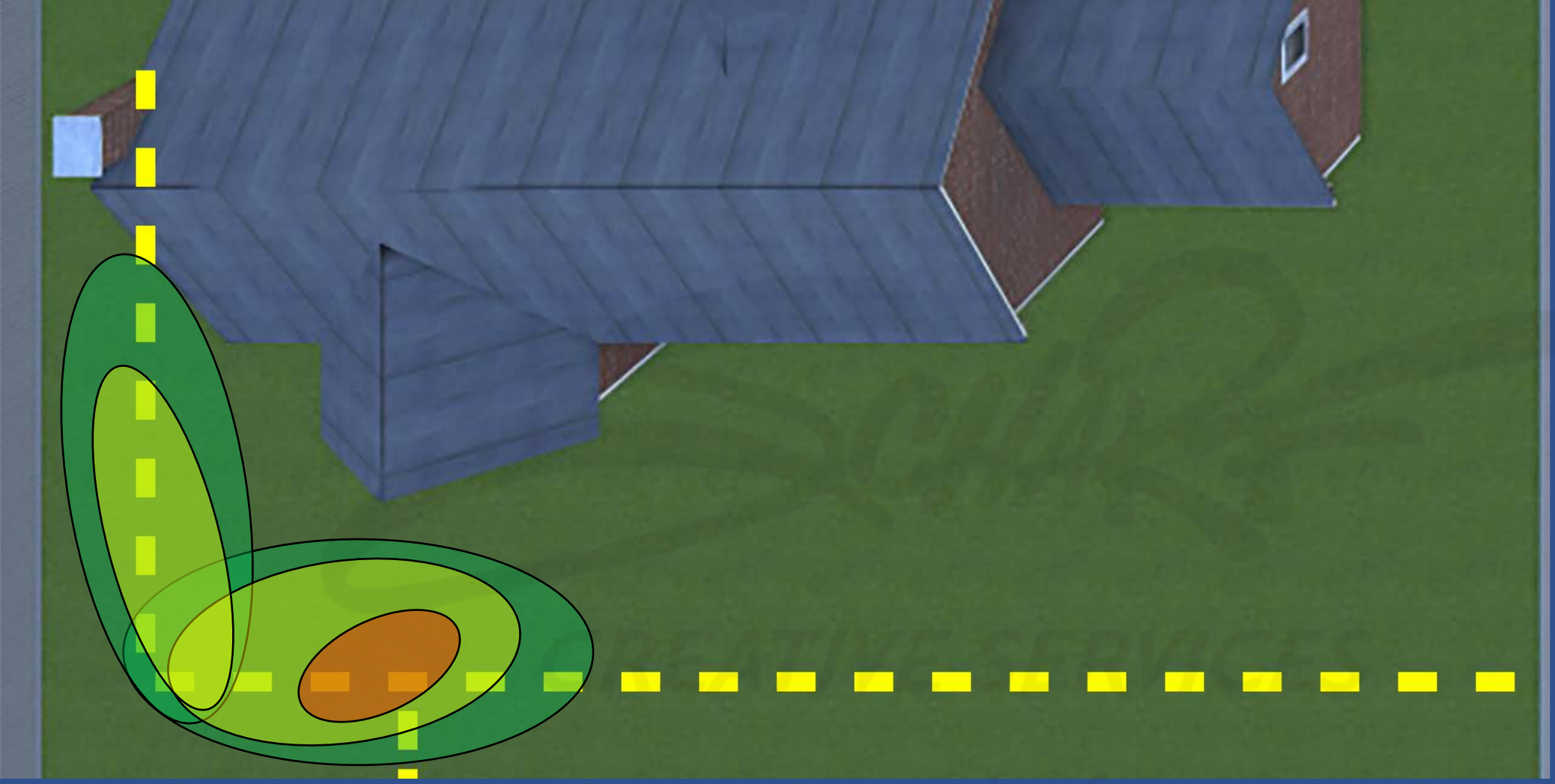

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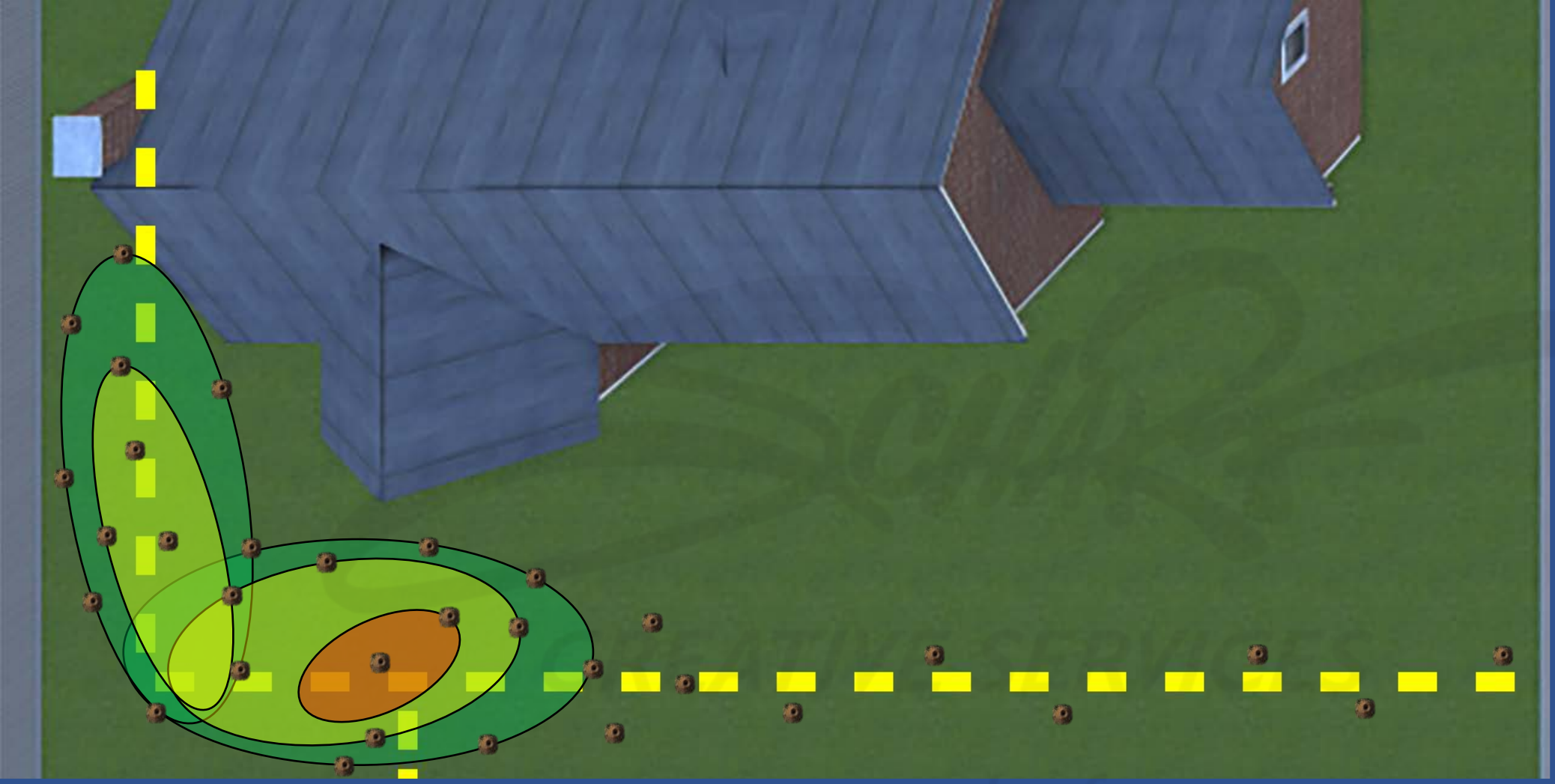

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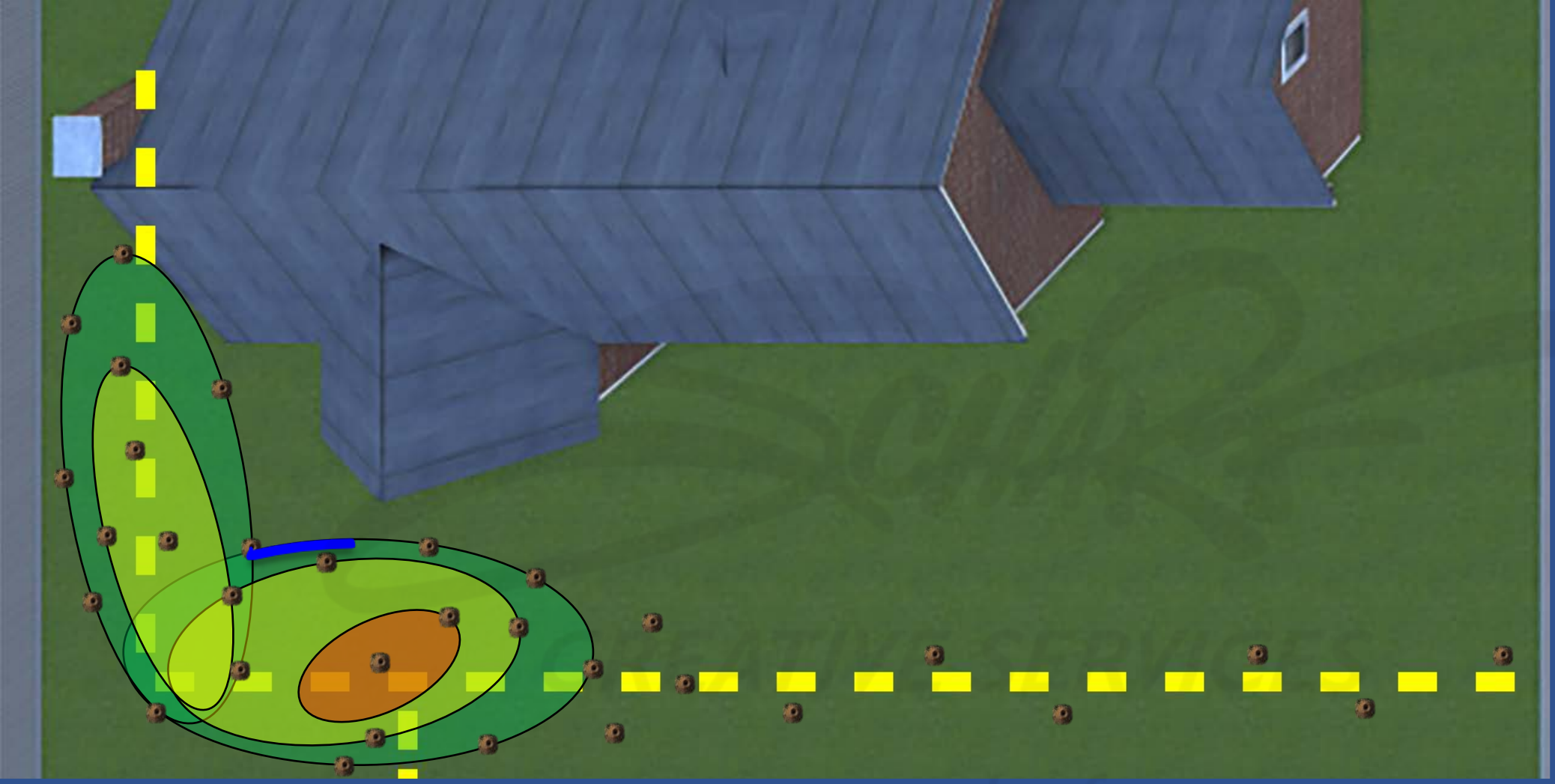

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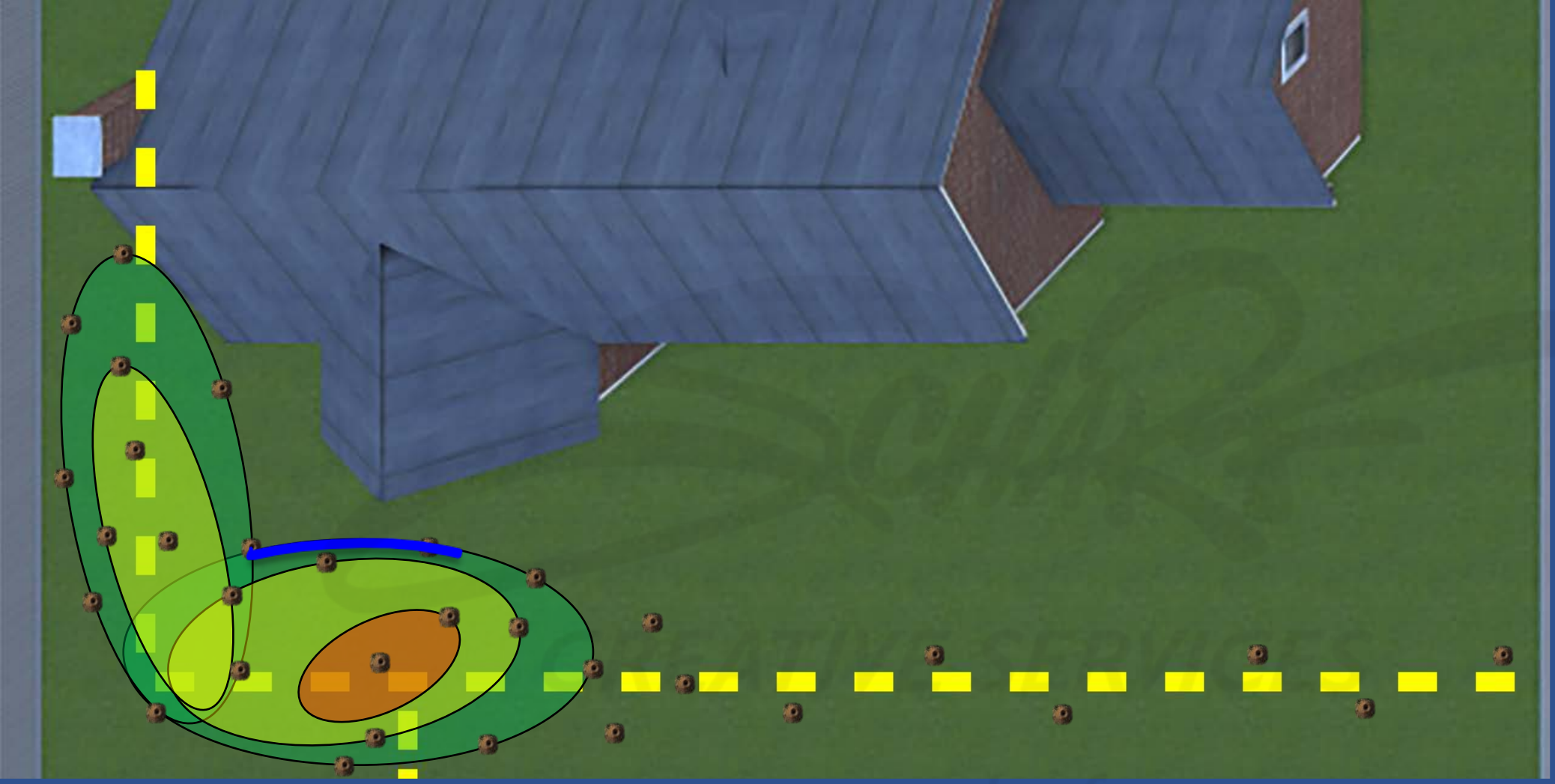

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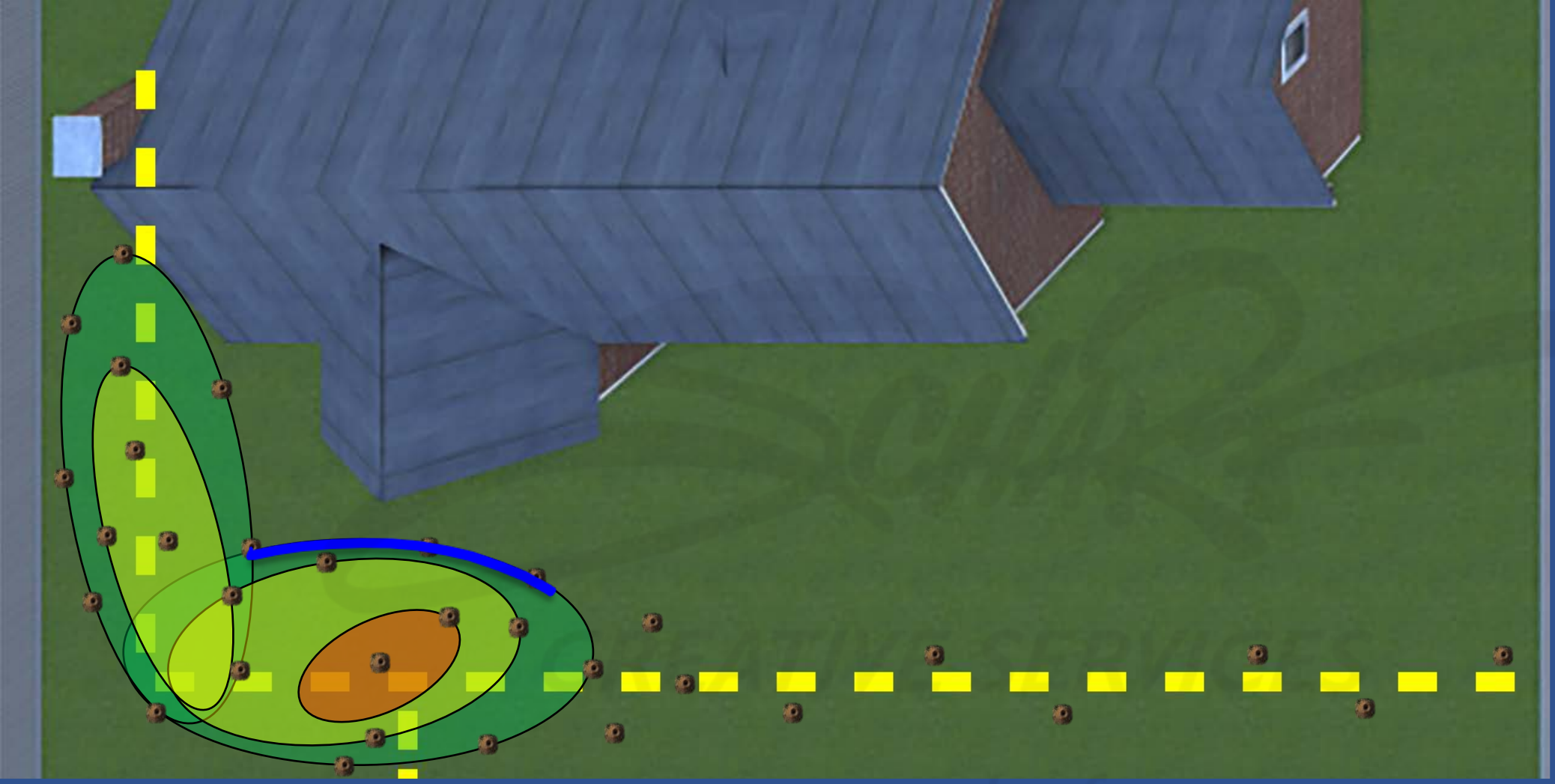

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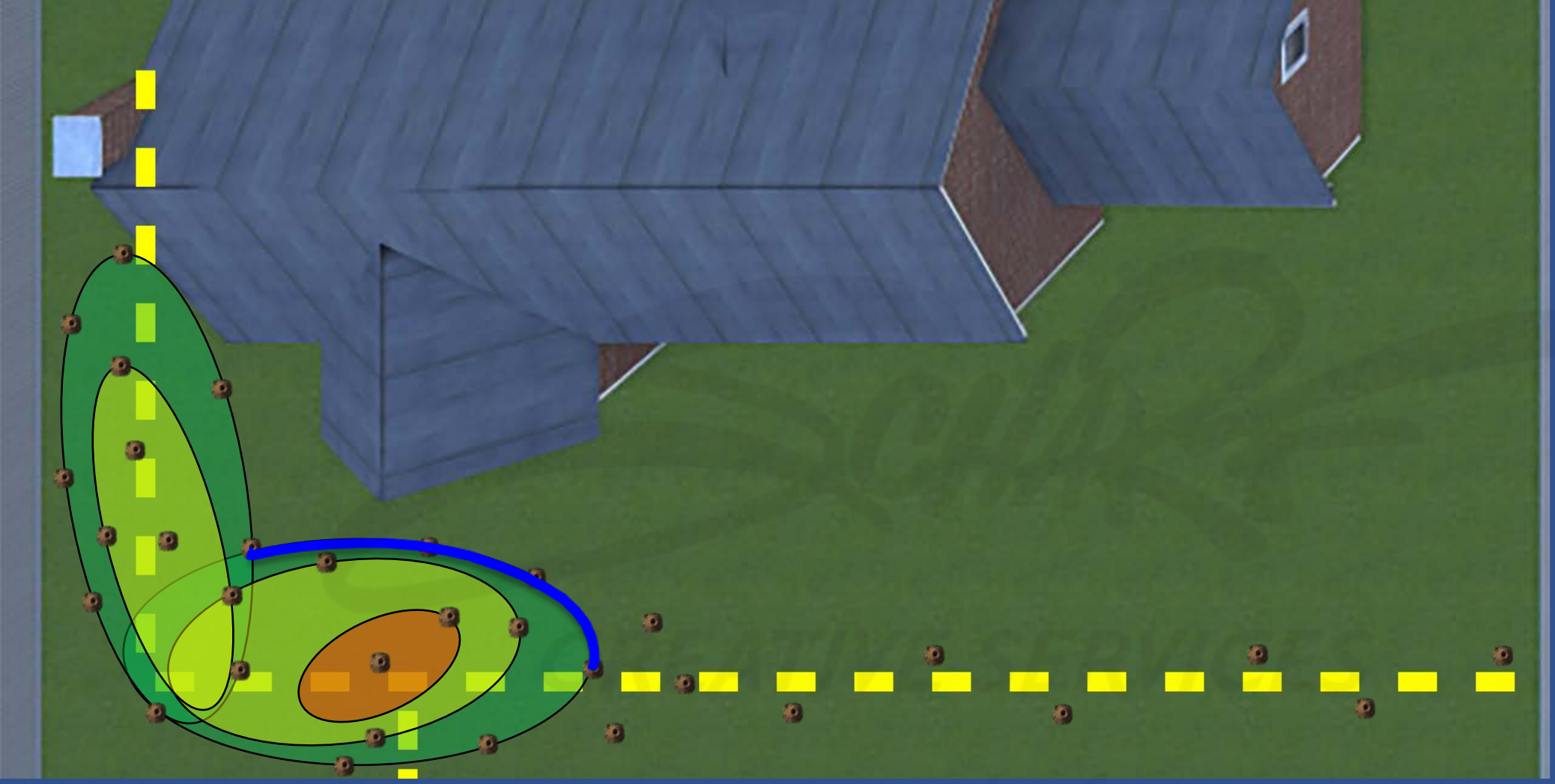

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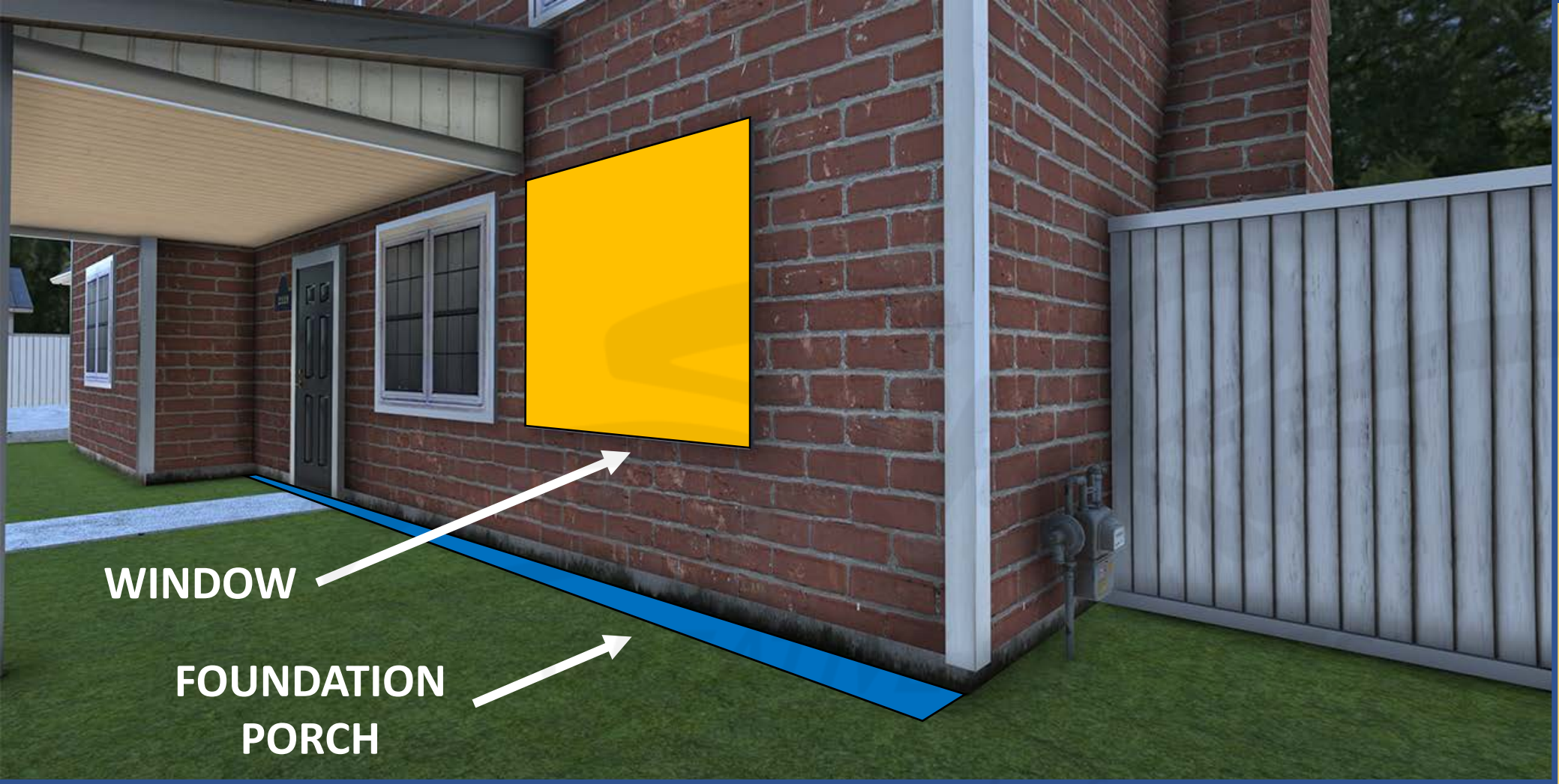

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Scenario 4

House at 2325 – Back Yard

- Large gas leak migration from two gas line tees.
- No readings at gas meter riser.
- No sources of ignition.
- No customer evacuation.

***DESCRIPTION**: The outside leak for SCENARIO 4 is located within the southeast corner of the backyard of HOUSE 2325. SLIDES 183-203 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 4.*

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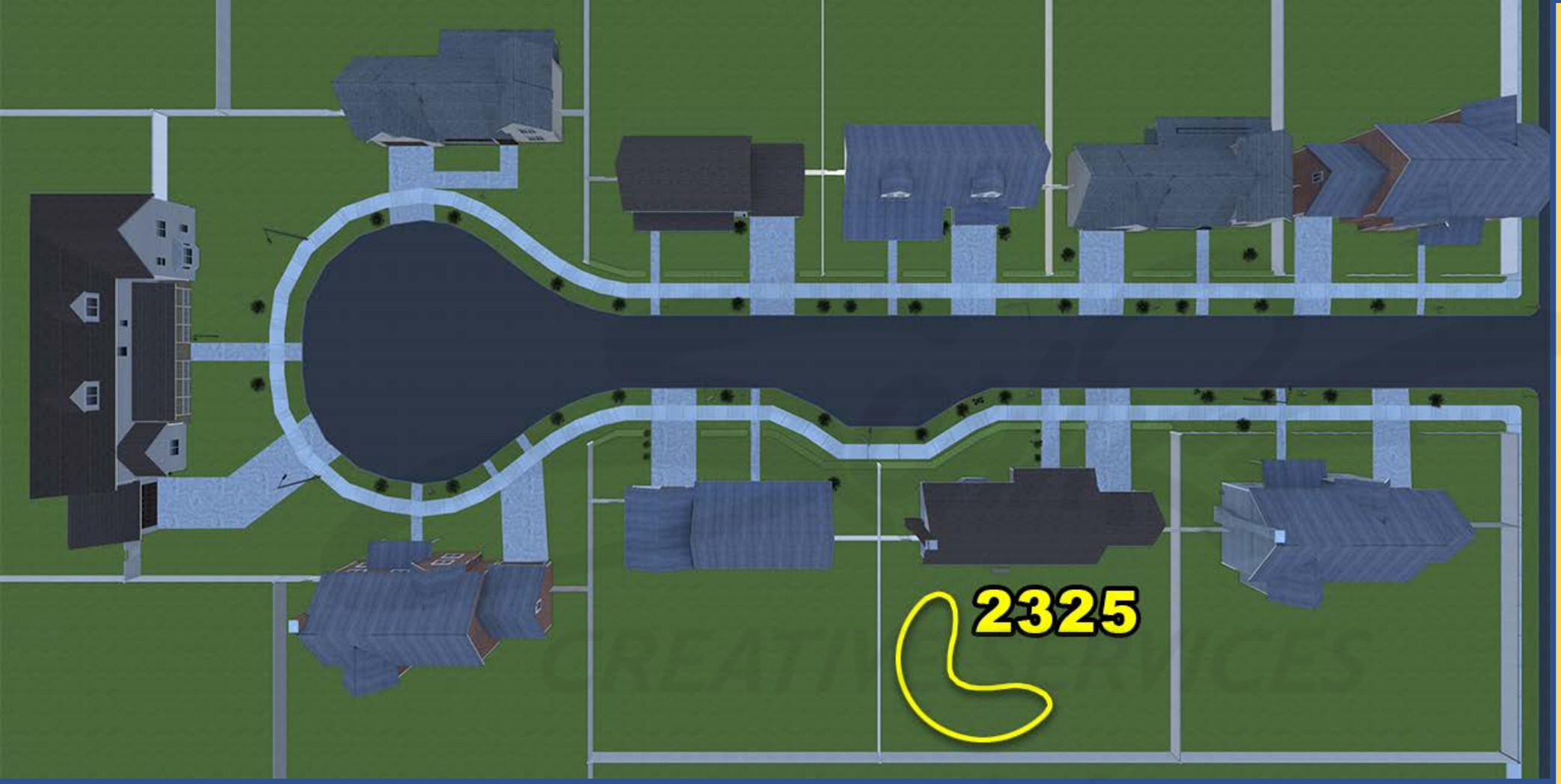

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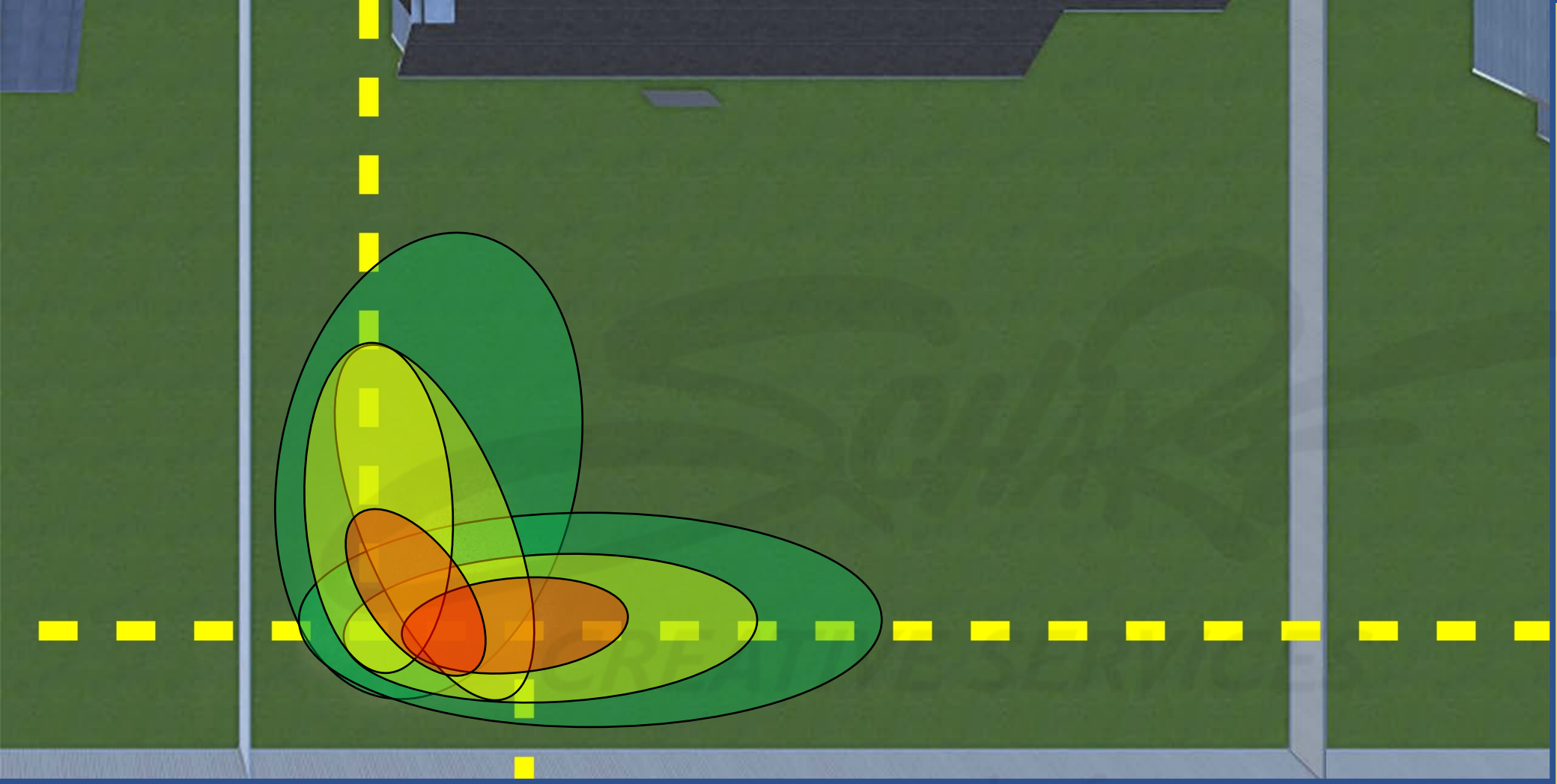

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***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 14 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 14 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 14 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 14 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 14 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 14 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

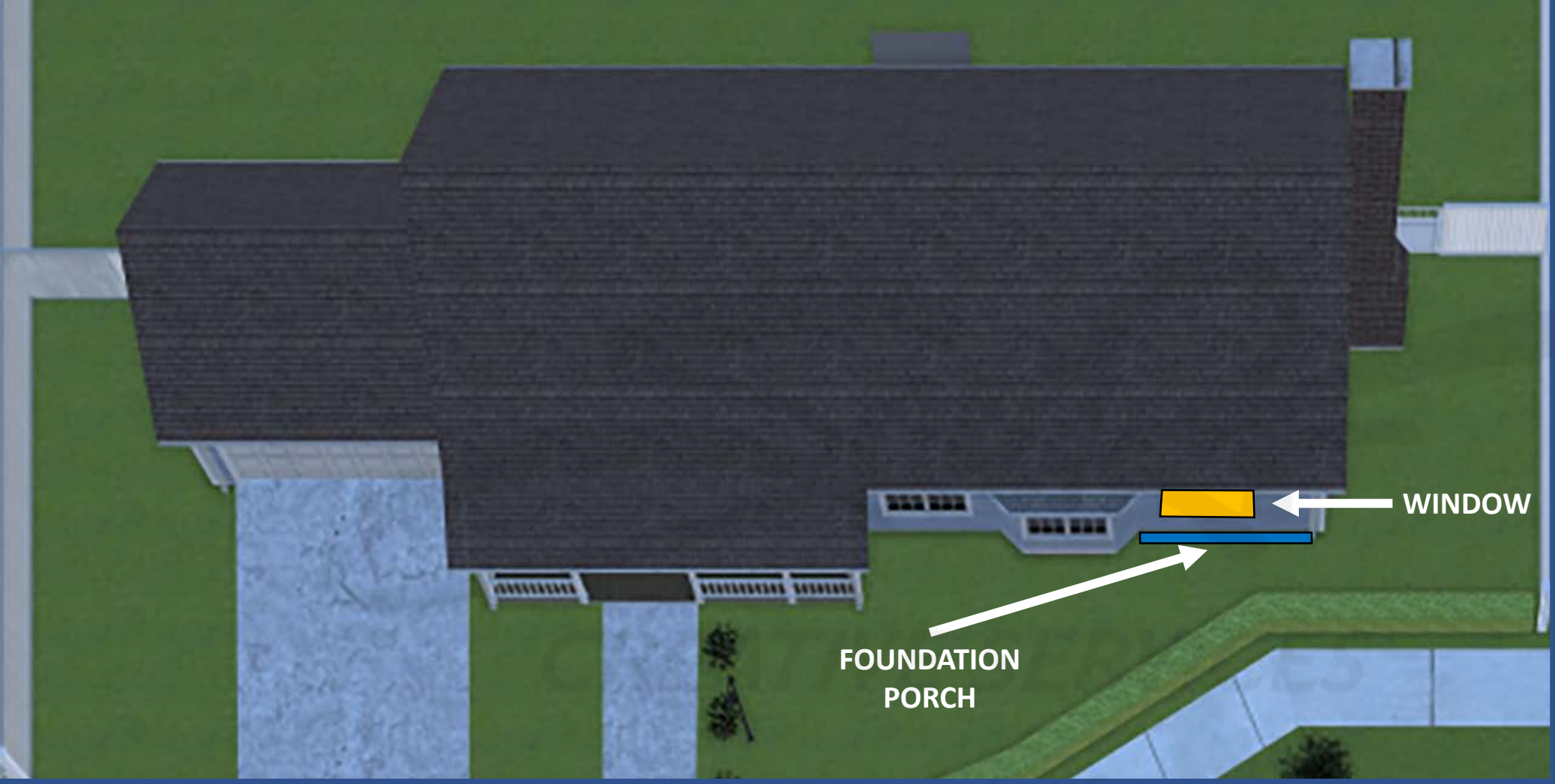
***DESCRIPTION**: The outside leak for SCENARIO 4 is located within the southeast corner of the backyard of HOUSE 2325. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a "confirmation outline" should appear to acknowledge success.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



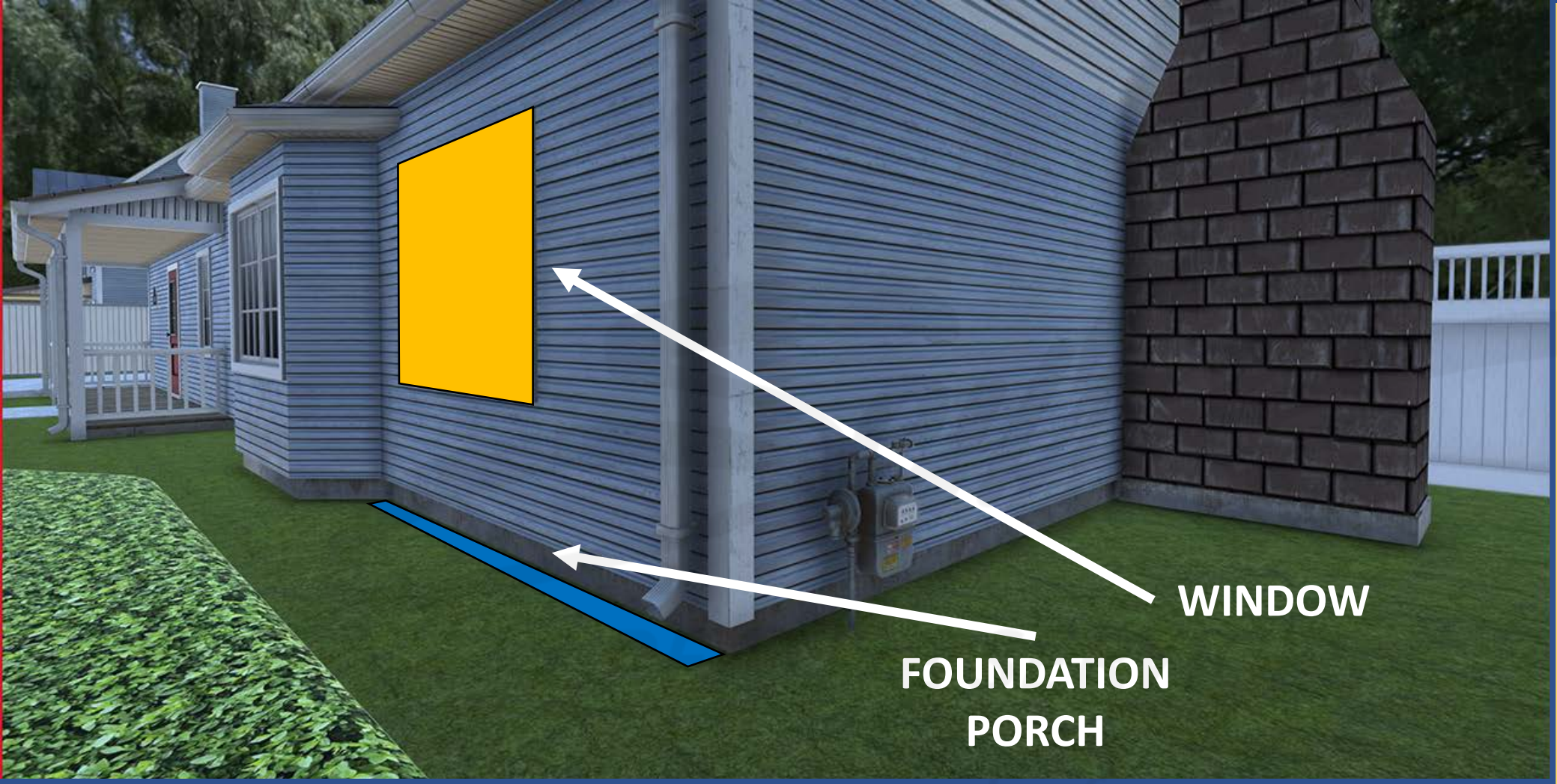
***DESCRIPTION**: The outside leak for SCENARIO 4 is located within the southeast corner of the backyard of HOUSE 2325. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a "confirmation outline" should appear to acknowledge success.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



***DESCRIPTION**: The outside leak for SCENARIO 4 is located within the southeast corner of the backyard of HOUSE 2325. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a "confirmation outline" should appear to acknowledge success.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.

Scenario 5

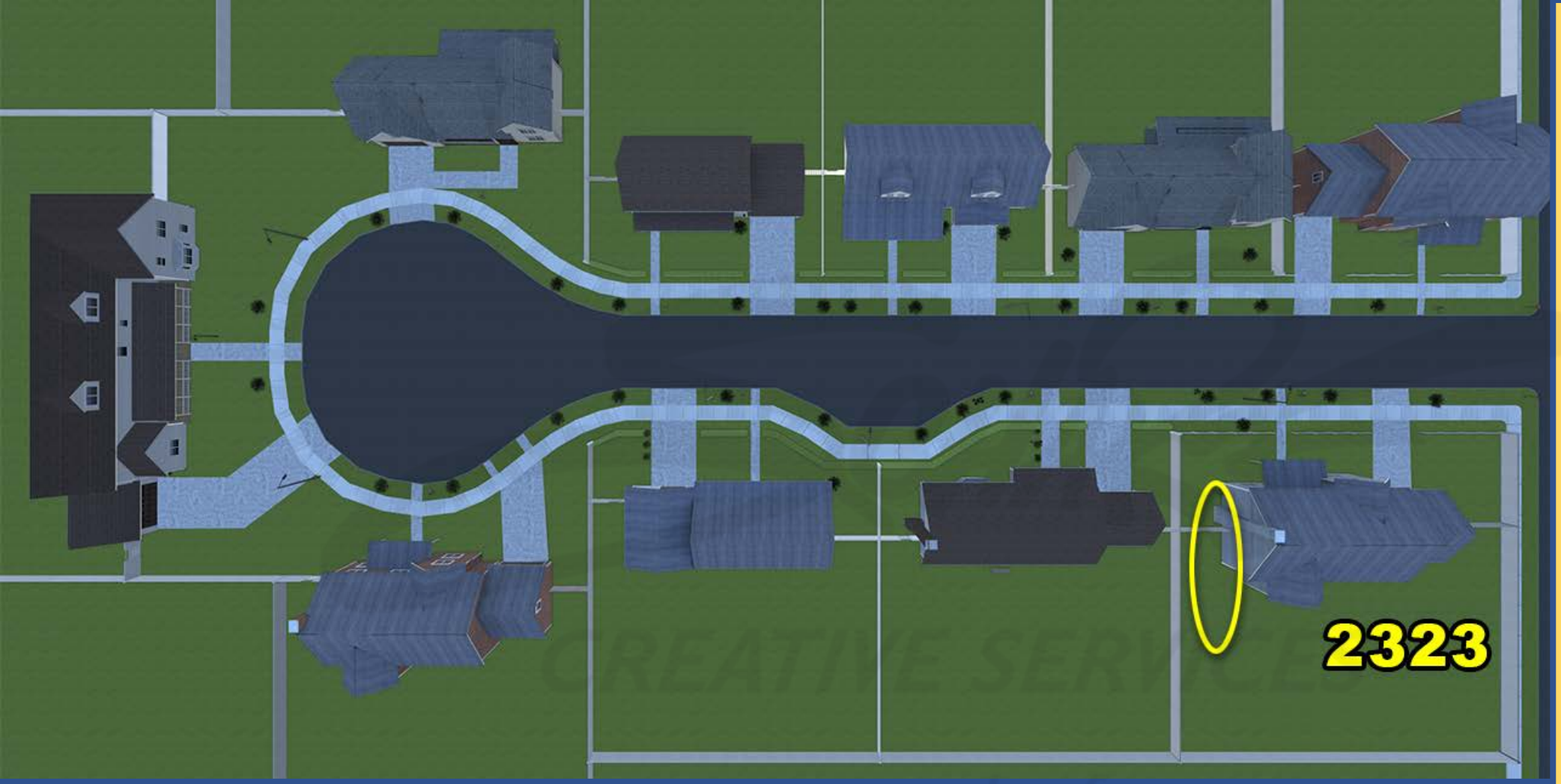
House at 2323 – Gas Meter

- Atmospheric readings
- Leak at gas meter
- Use spray bottle to see bubbles
- Shut off gas meter via gas meter *or* customer line shutoff valve

***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. SLIDES 208-215 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 5. There are to be no visual cues (dying/dead vegetation) at this leak location. The client facilitator will be able to choose from the GAS METER SHUTOFF VALVE or the CUSTOMER LINE SHUTOFF VALVE (within ENDEAVR scenario variables) as one of two ways by which the user must shutoff the gas from the leak source on the gas meter.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

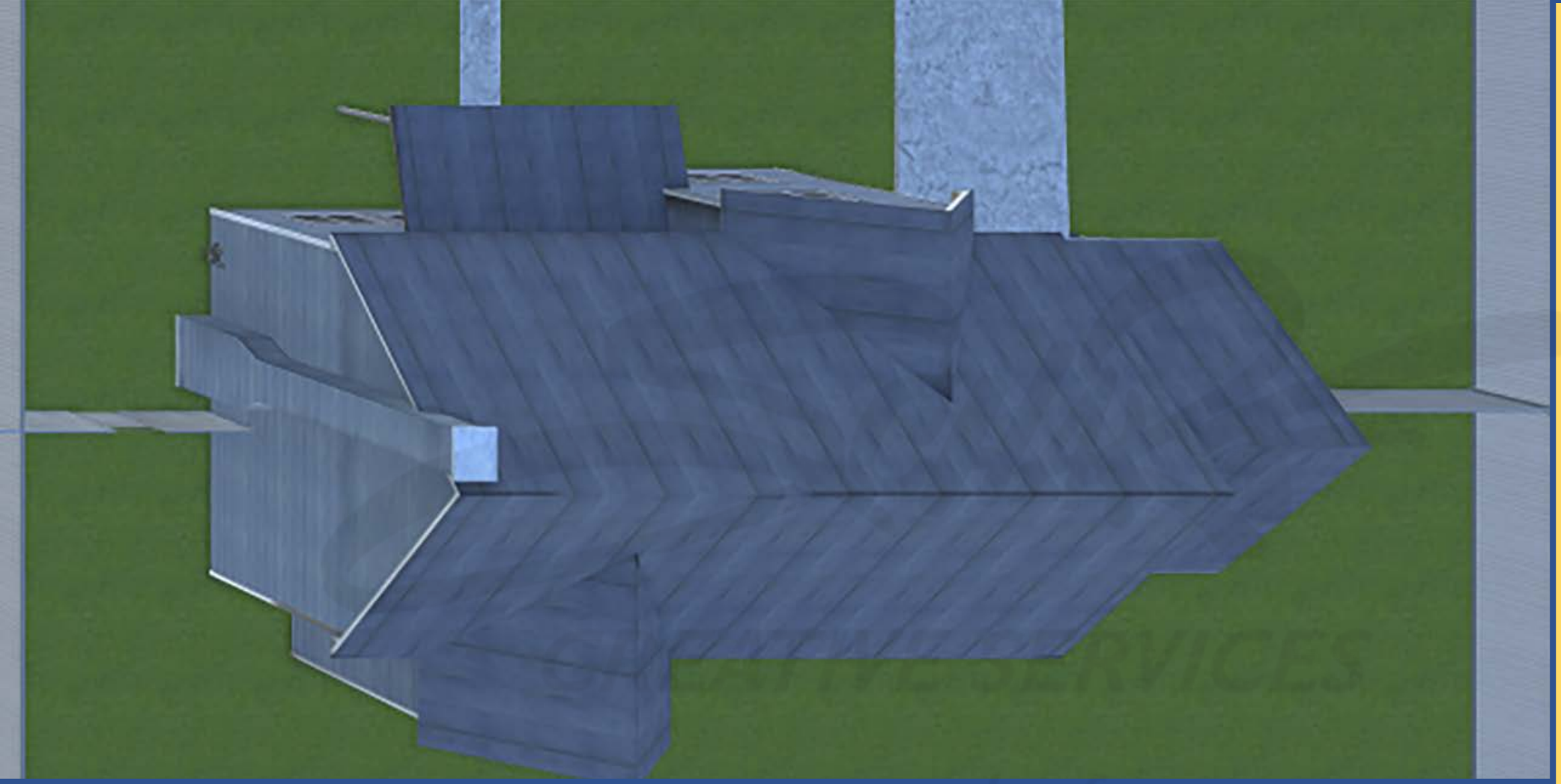


***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. SLIDES 208-215 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 5. There are to be no visual cues (dying/dead vegetation) at this leak location. The client facilitator will be able to choose from the GAS METER SHUTOFF VALVE or the CUSTOMER LINE SHUTOFF VALVE (within ENDEAVR scenario variables) as one of two ways by which the user must shutoff the gas from the leak source on the gas meter.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

SLIDES 208-215 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 5.



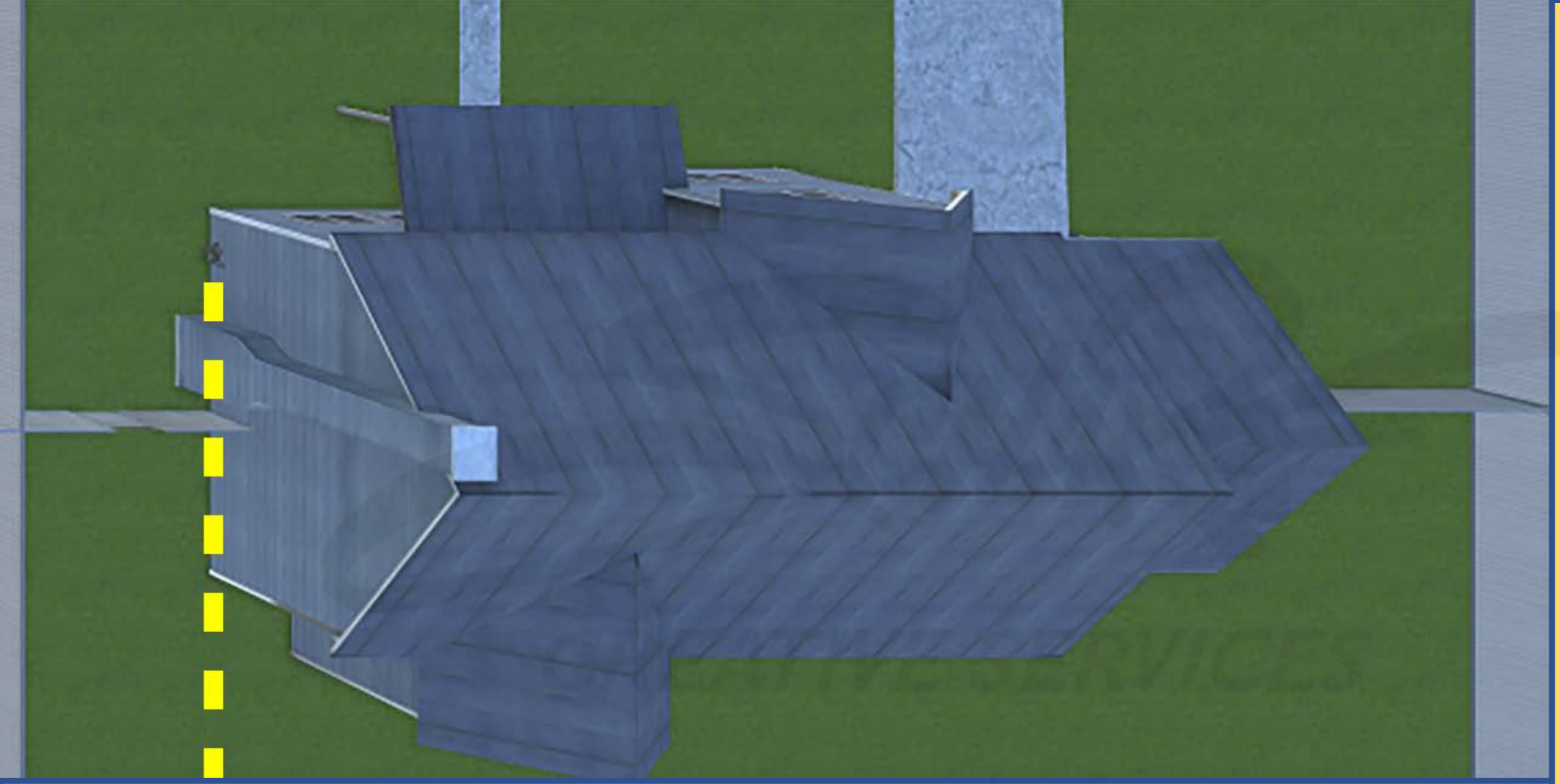
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



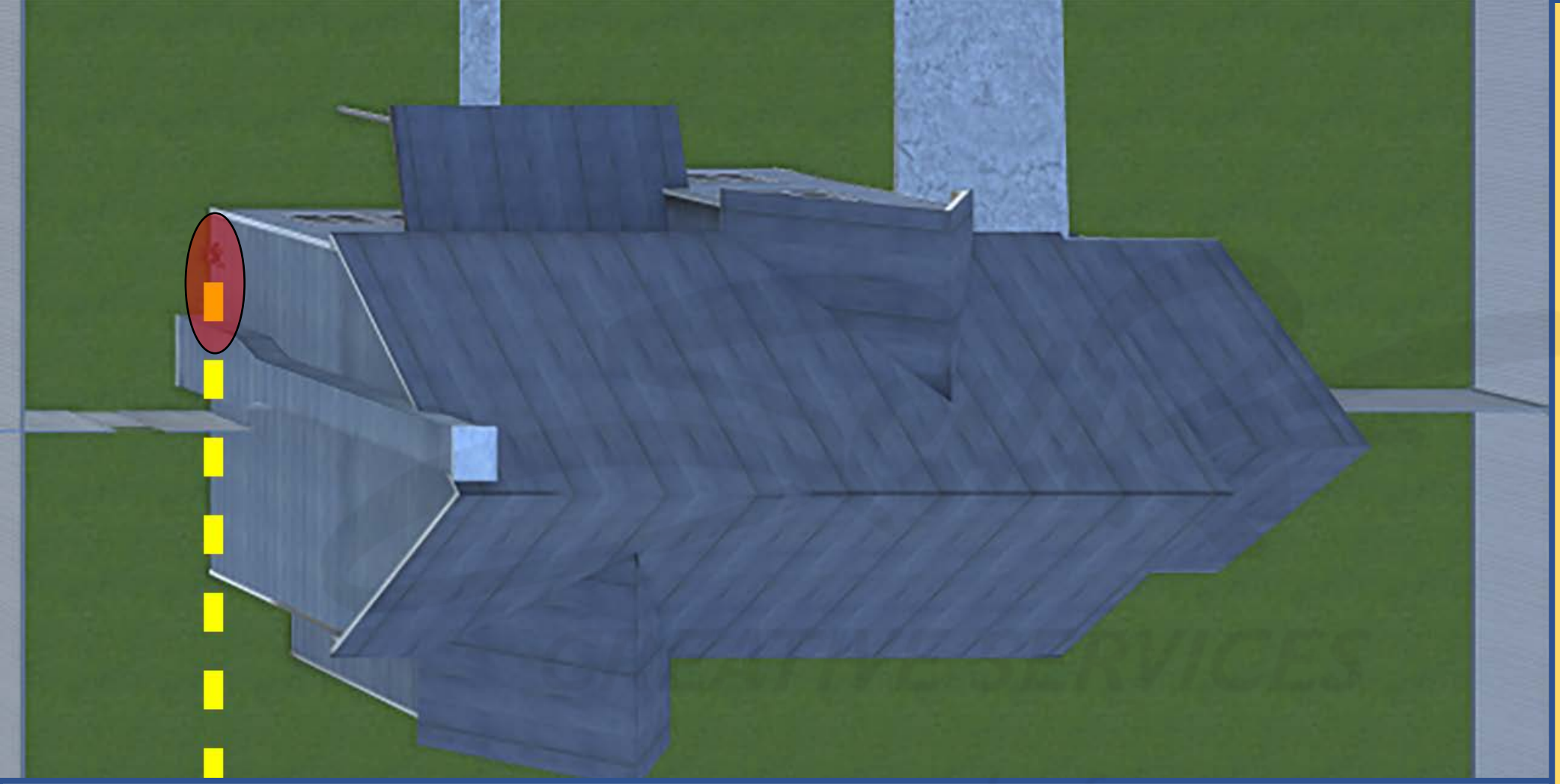
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



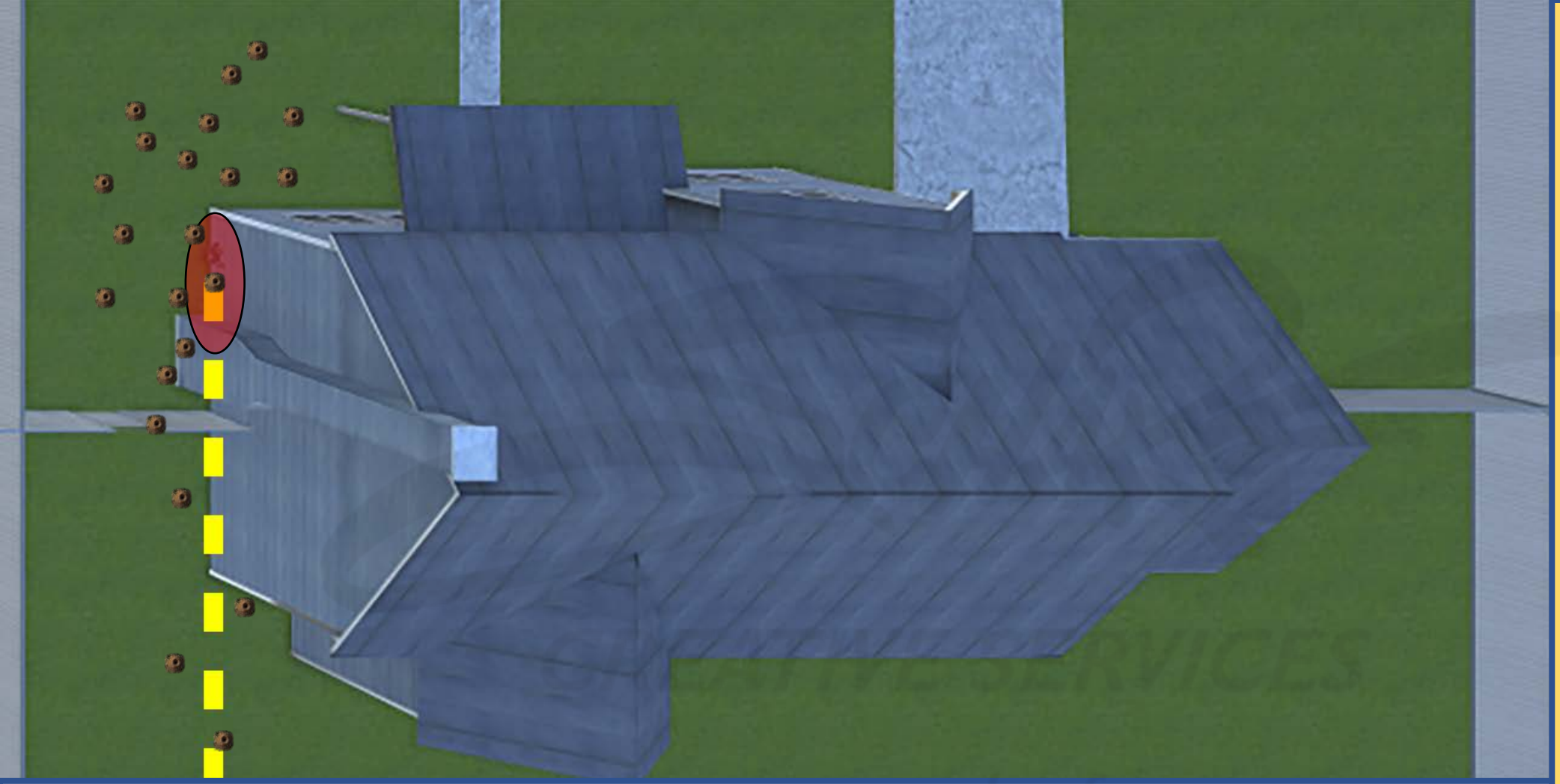
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



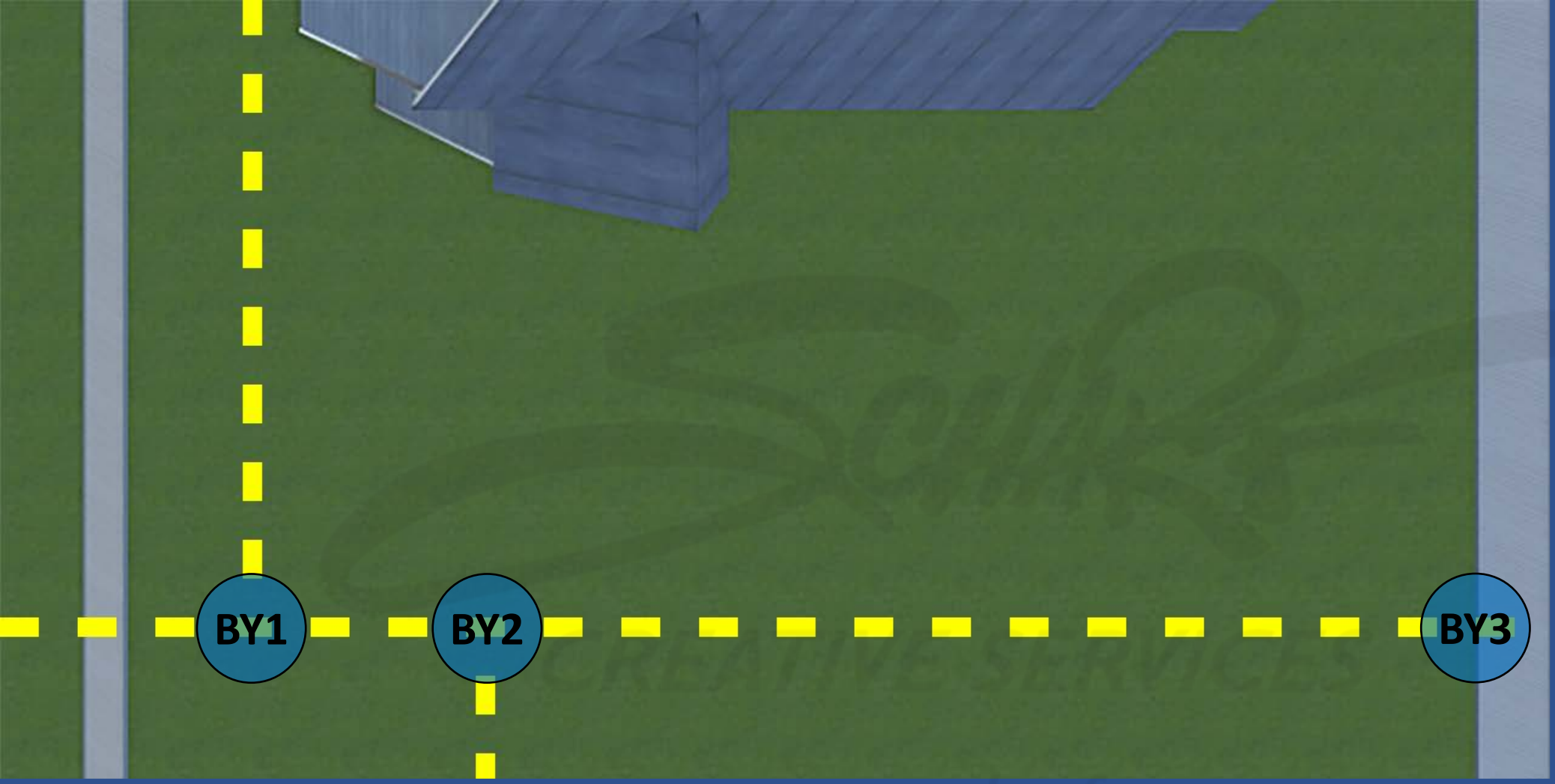
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



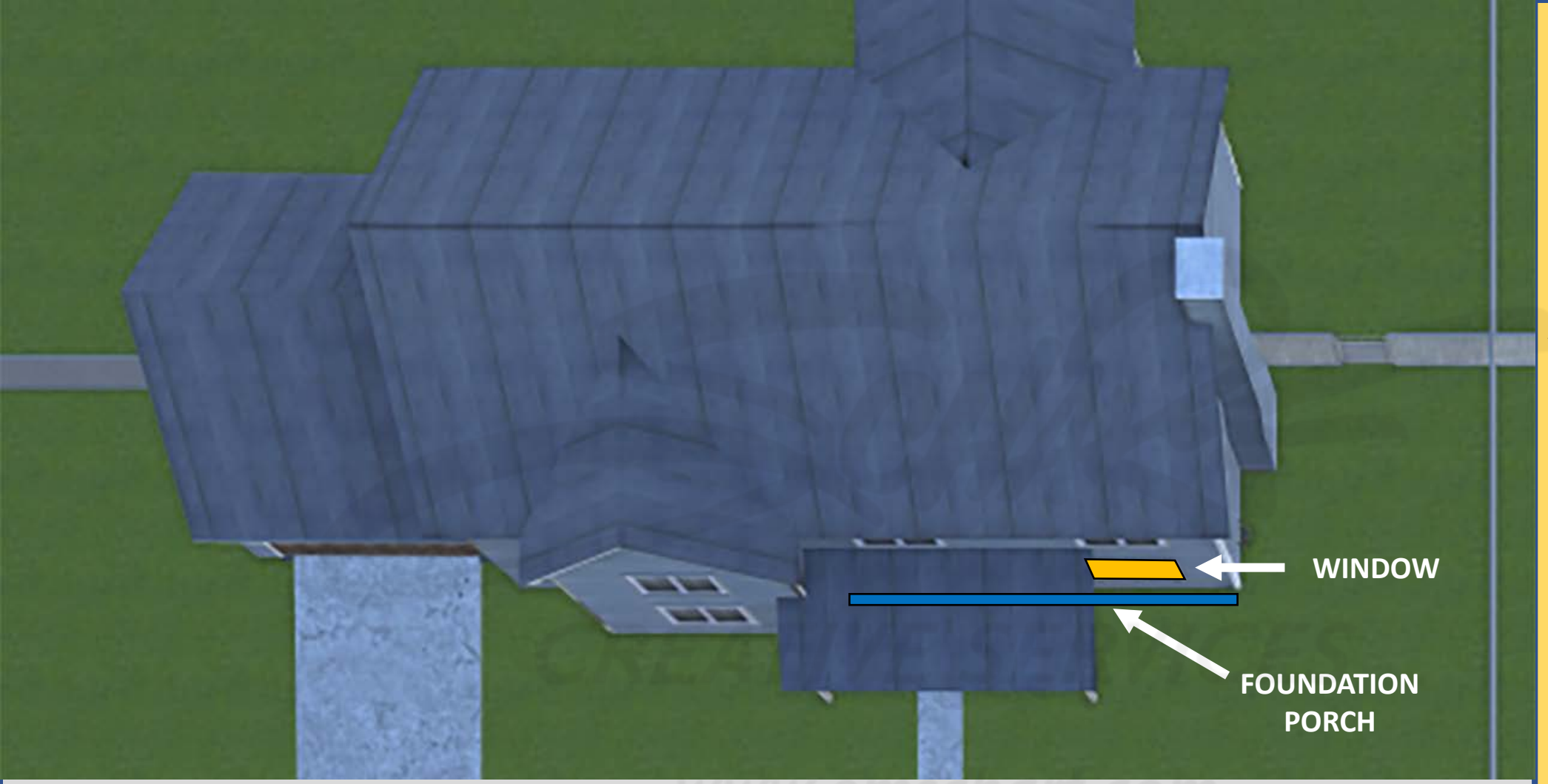
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



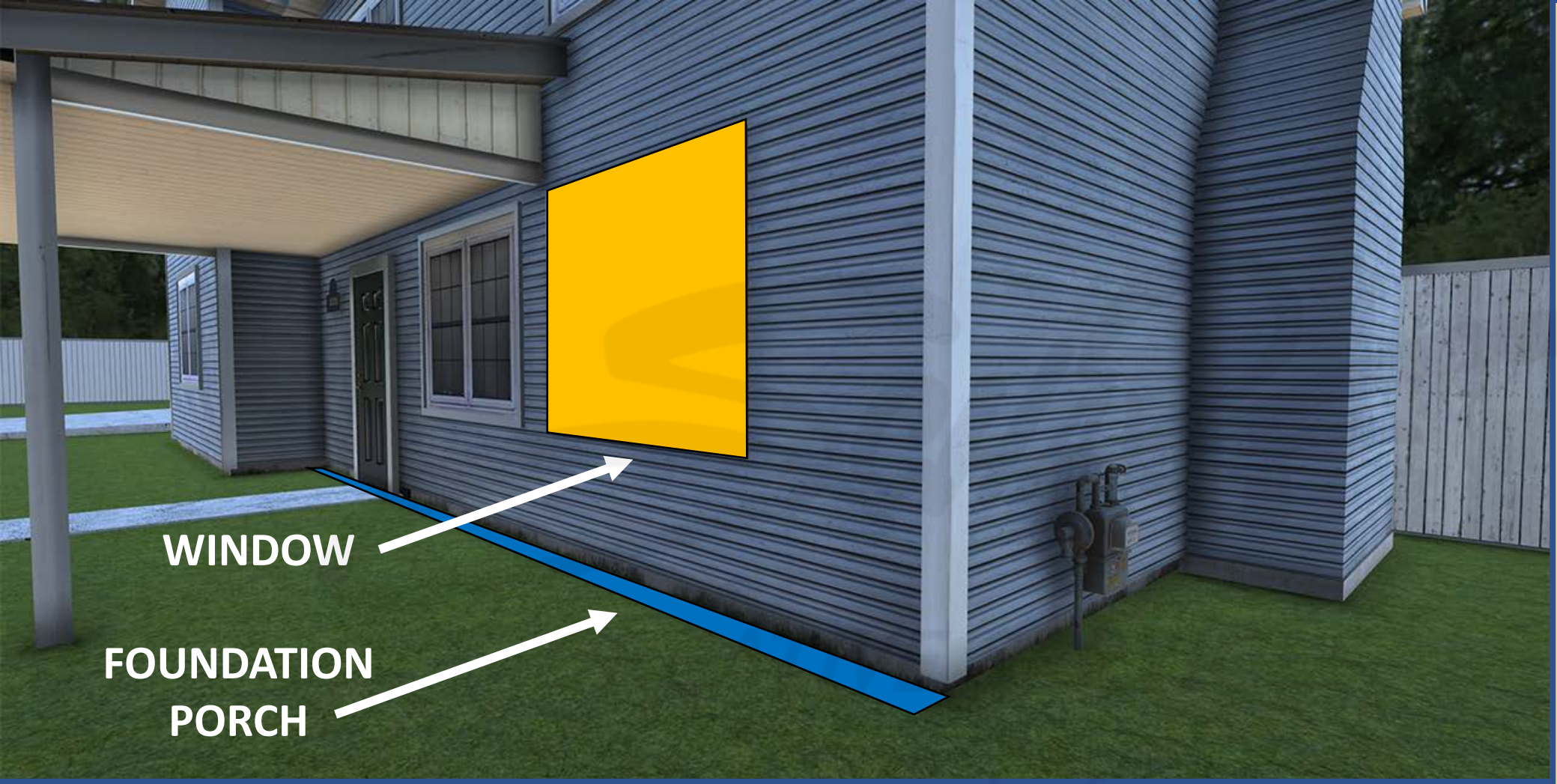
***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

DEVELOPERS:

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).



***DESCRIPTION**: The outside leak for SCENARIO 5 is located just beyond the northwest corner of the backyard of HOUSE 2323. There are NO UNDERGROUND GAS LEAK ZONES for this scenario. There will be NO CONFIRMATION OUTLINE to acknowledge success. There is only ONE ABOVEGROUND GAS LEAK ZONE associated with the gas meter, THE leak source itself (with a perimeter-to-source range of .01% to 3%). Users CAN still CHOOSE to bar hole as often as preferred into organic navigable surfaces. The user can also utilize the spray bottle and the wrench. There will be NO RED TAG or RED TAPE activities.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

There is only ONE ABOVEGROUND LEAK ZONE (with a perimeter-to-source range of .01% to 3%) that is invisible to the user and does not impede the user.

NO CONFIRMATION OUTLINE for this scenario. The user must locate and shutoff the gas meter leak (via gas meter shutoff valve or customer line shutoff valve).

Scenario 6

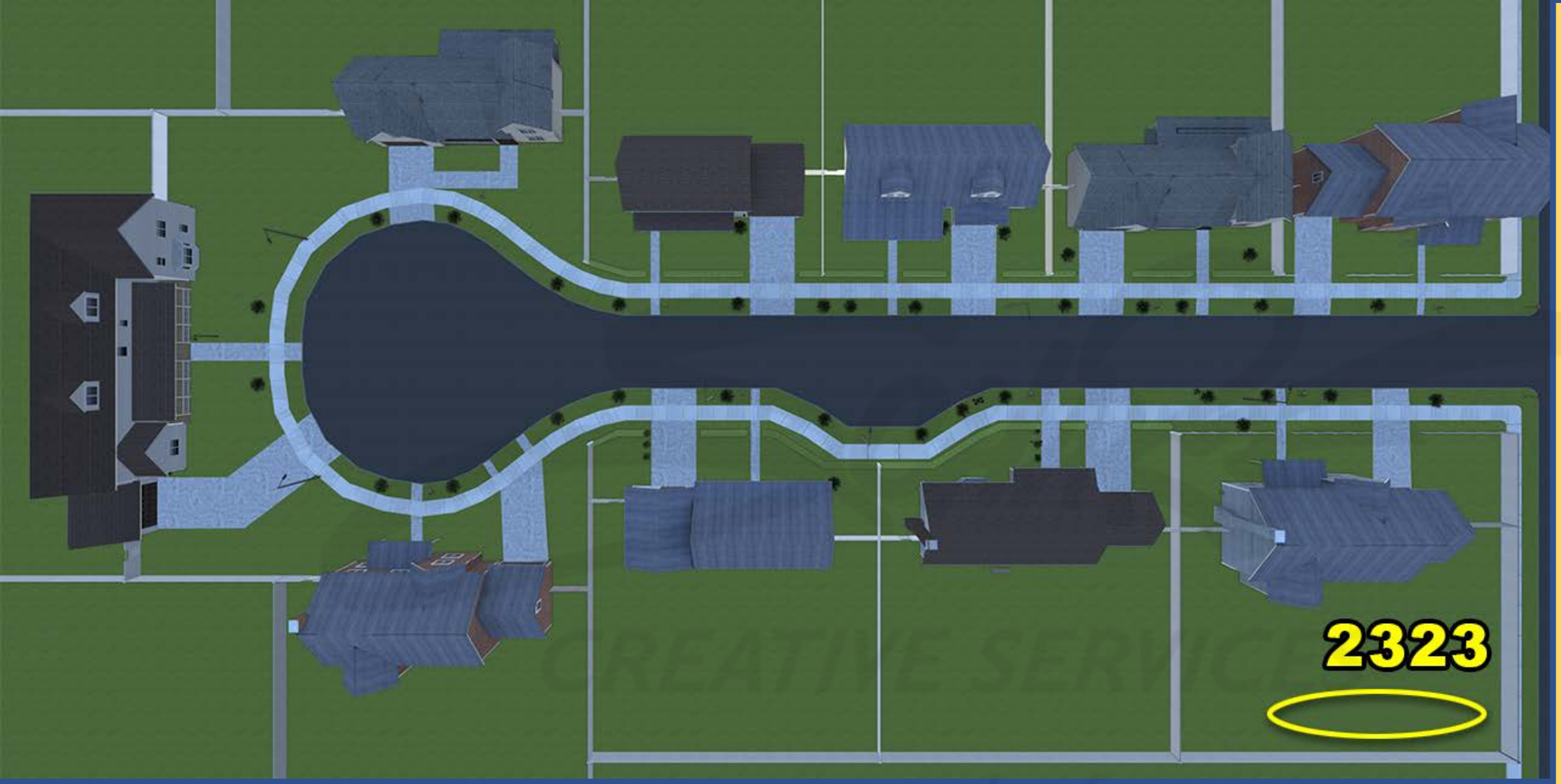
House at 2323 – Back Yard

- Small underground leak
- Little migration
- No customer evacuation
- No sources of ignition

***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. SLIDES 224-243 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 6. There are to be no visual cues (dying/dead vegetation) at this leak location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.



***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. SLIDES 219-234 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 6. There are to be no visual cues (dying/dead vegetation) at this leak location.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

SLIDES 219-234 are simply a top-down, step-by-step explanation of requirements for the leak area of SCENARIO 6.

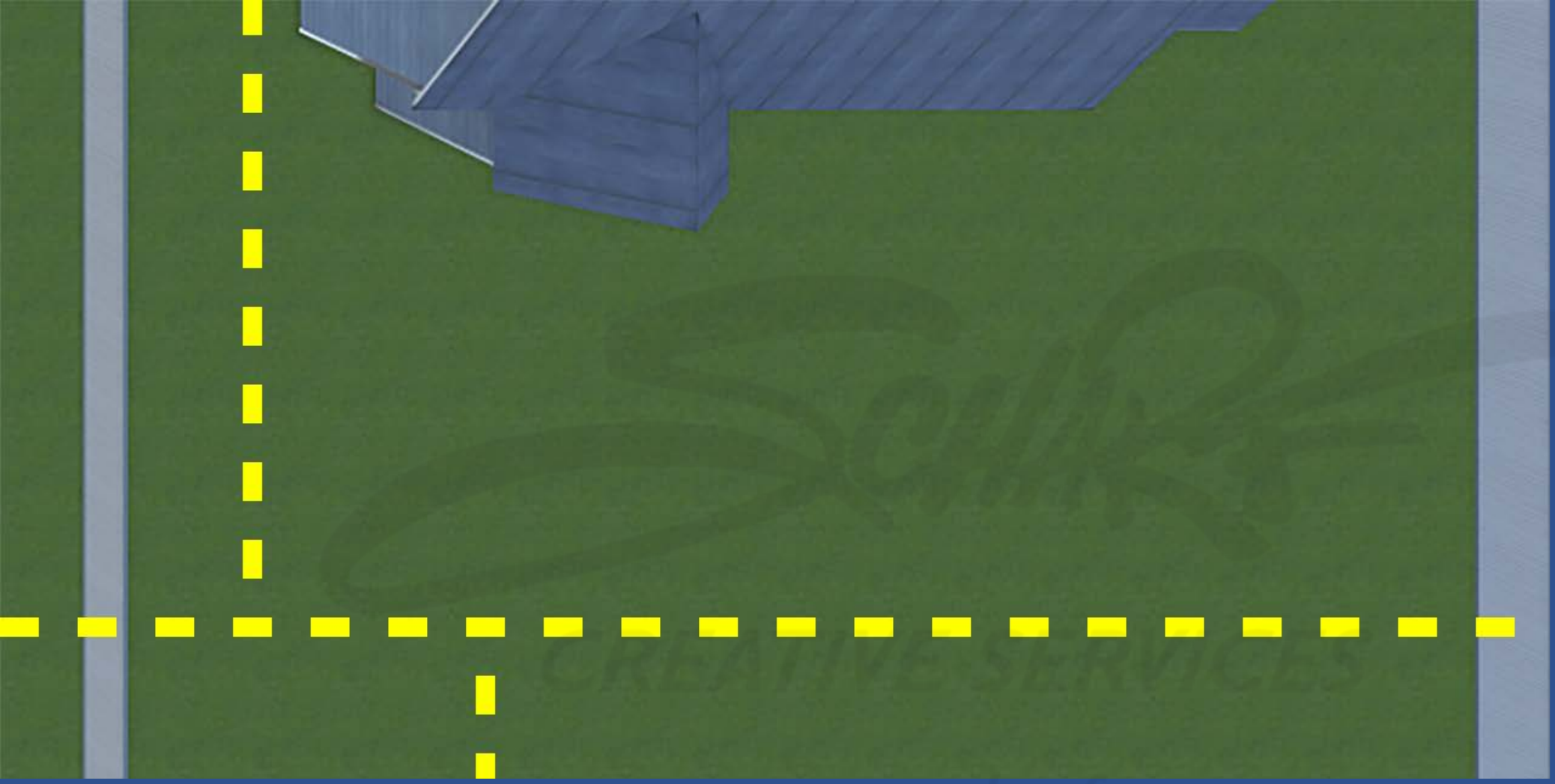
***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a CONFIRMATION OUTLINE should appear to acknowledge success.*

***DEVELOPERS**:*

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



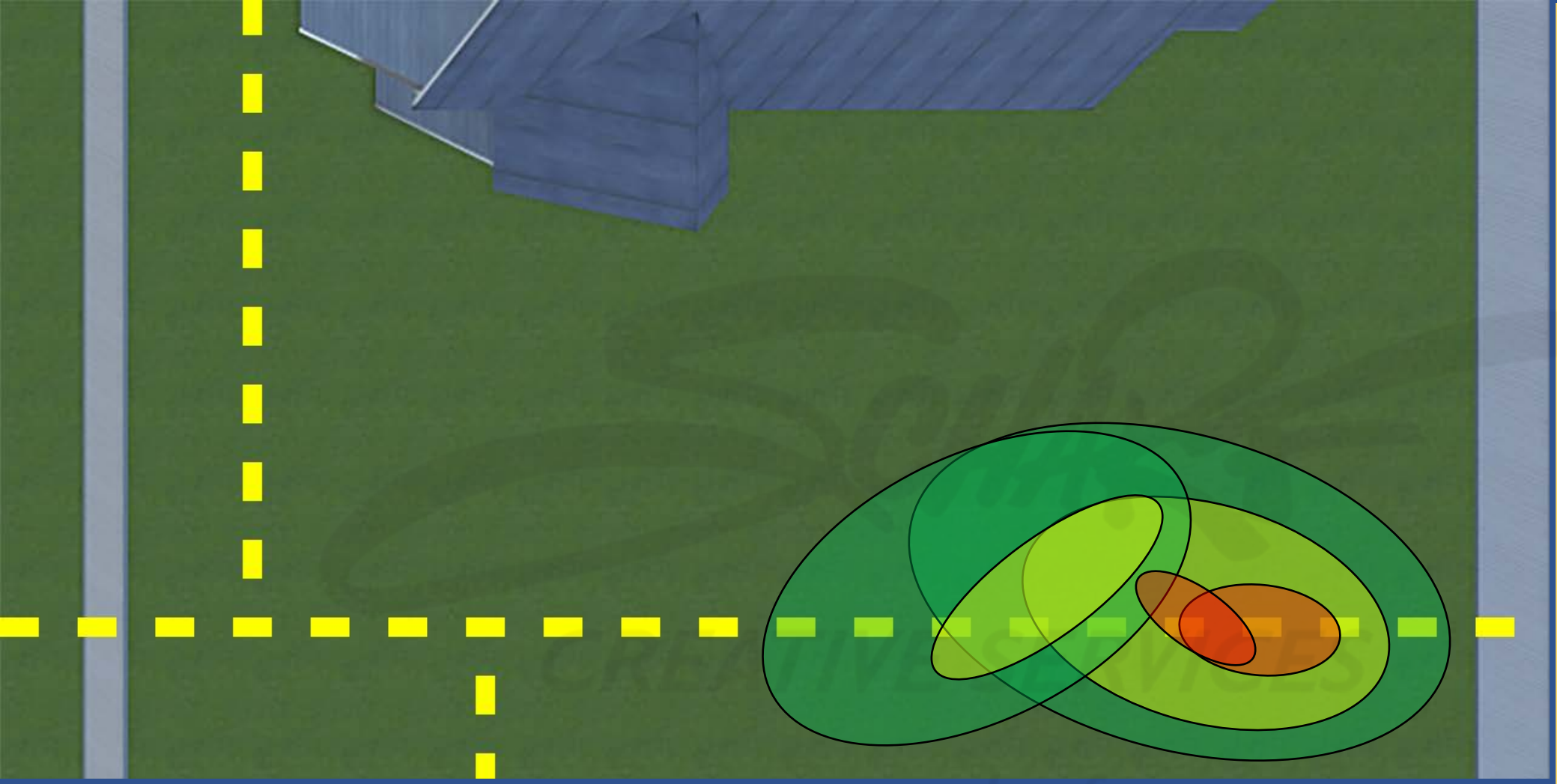
***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a CONFIRMATION OUTLINE should appear to acknowledge success.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



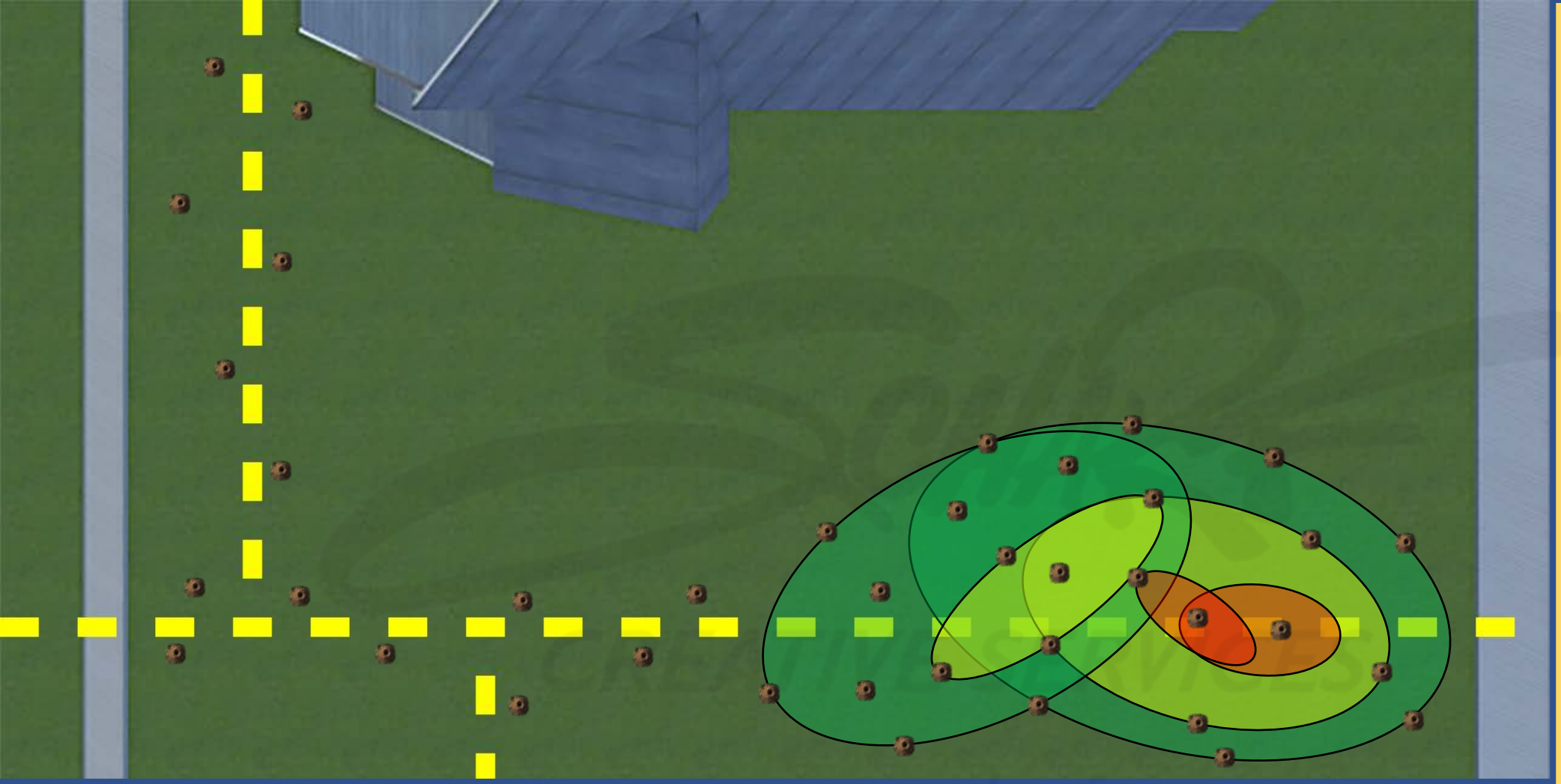
***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a CONFIRMATION OUTLINE should appear to acknowledge success.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



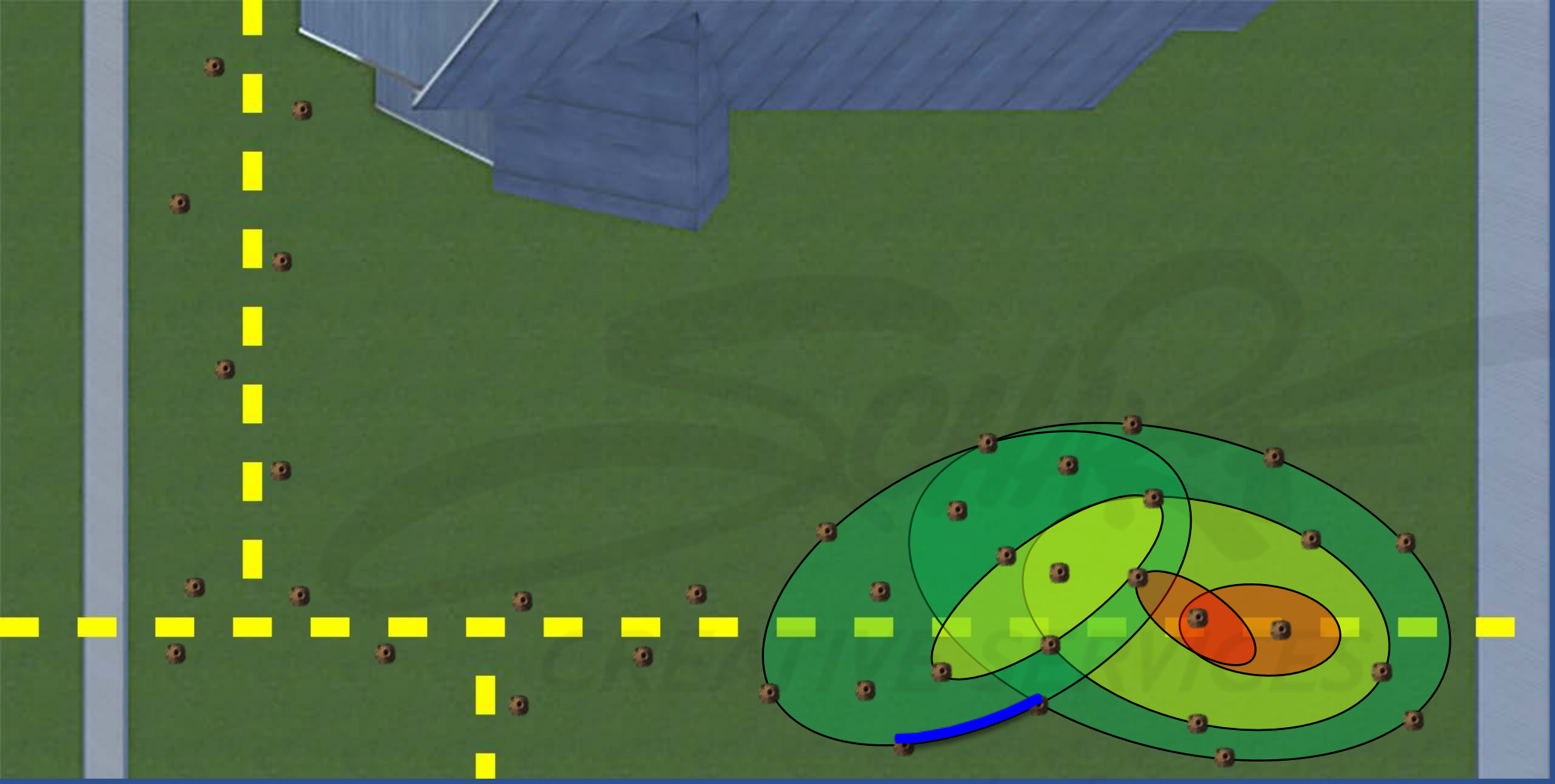
***DESCRIPTION**: The outside leak for SCENARIO 6 is located within the southeast corner of the backyard of HOUSE 2323. It is comprised of three underground zones – from least to most saturated with natural gas and each with unique measurement ranges – GREEN (0% to 24%), YELLOW (25% to 49%), and RED (50% to 100%). Users CAN bar hole as often as preferred into organic navigable surfaces. Users CANNOT bar hole into artificial navigable surfaces. Once a user locates the extent of the leak area, a CONFIRMATION OUTLINE should appear to acknowledge success.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



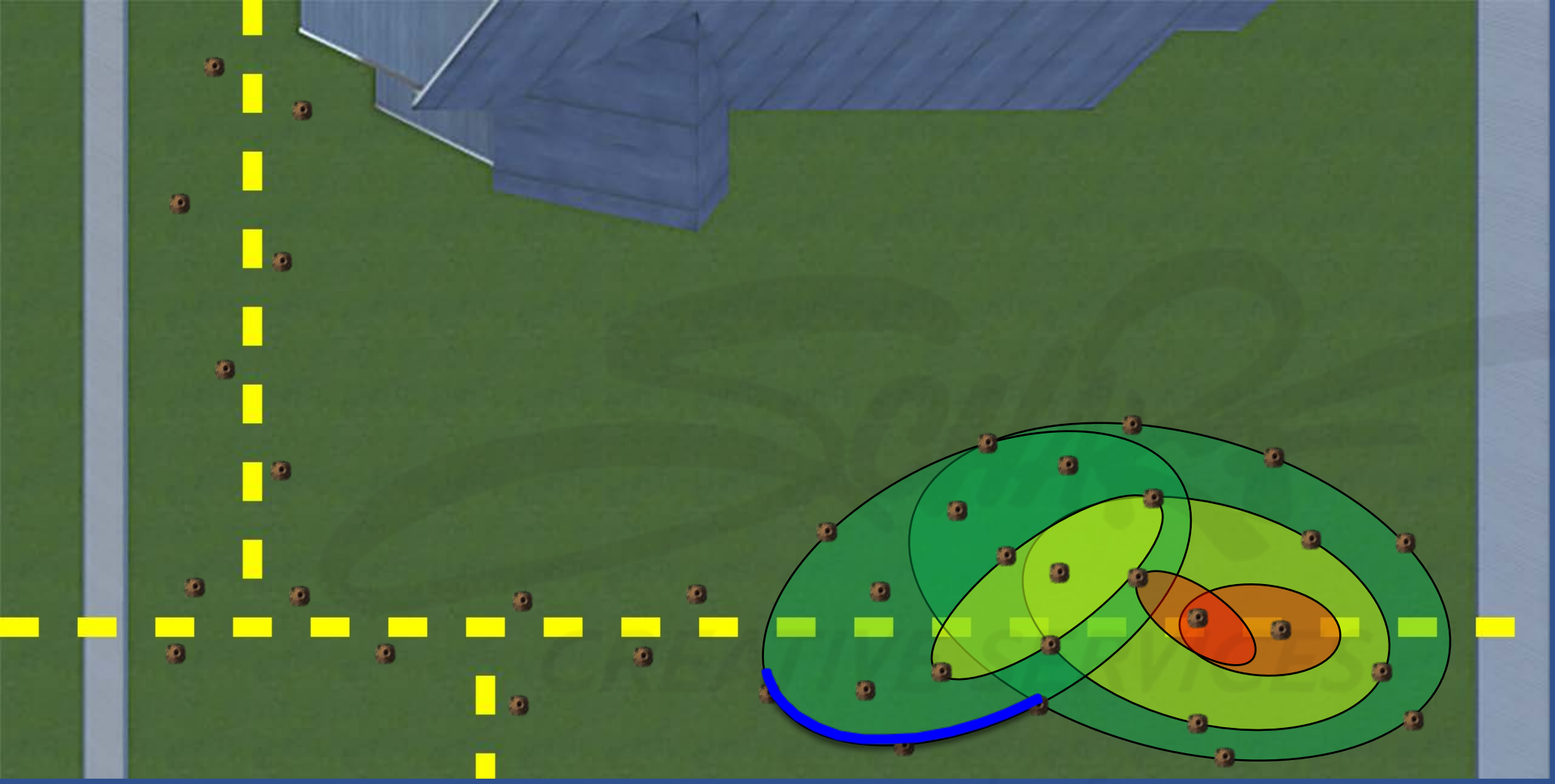
***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 11 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 11 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



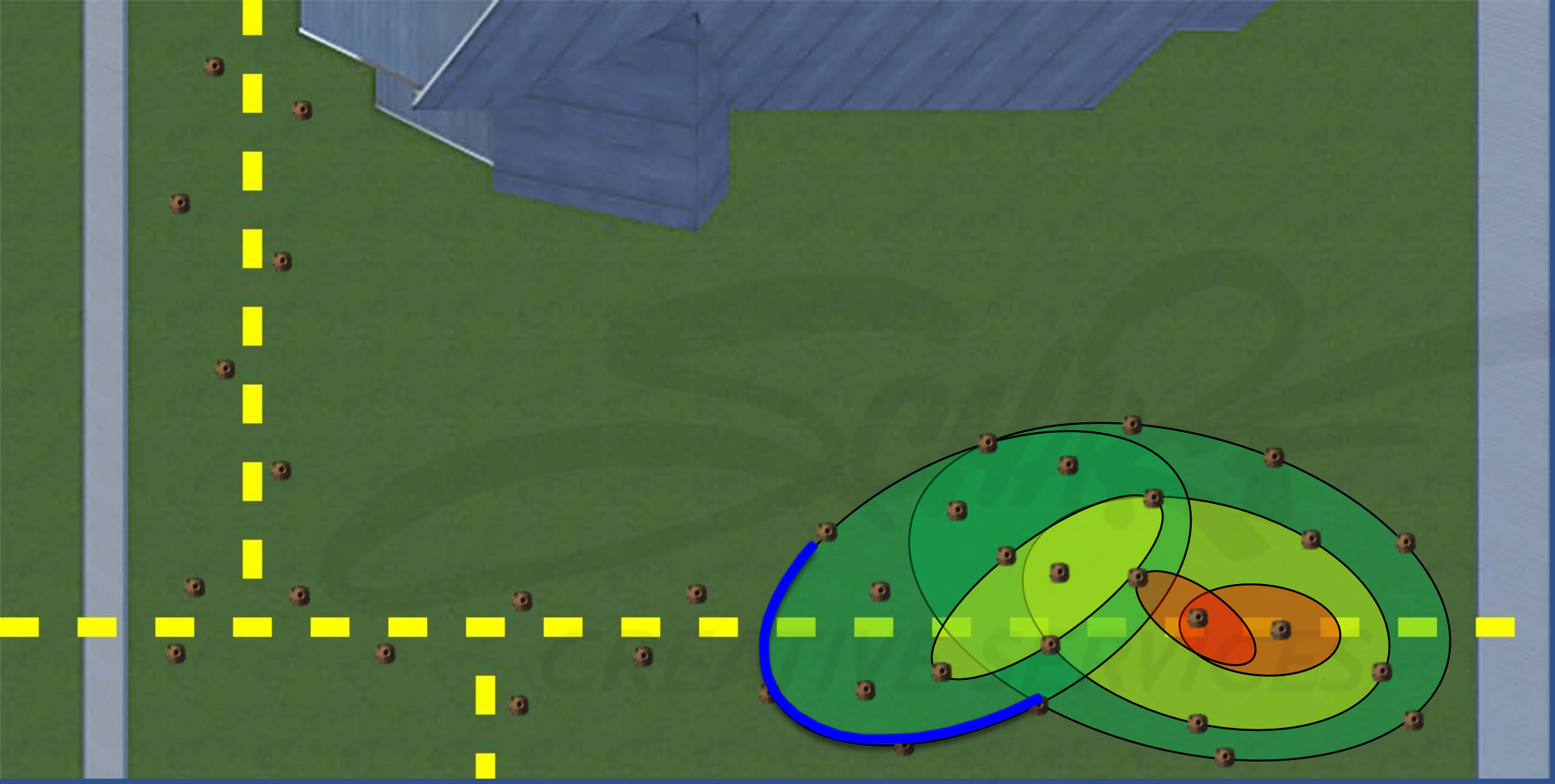
***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 11 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 11 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

The CONFIRMATION OUTLINE is a ground level visual "reward." The user can still select COMPLETE on the WORK ORDER whether they succeed with detection or not.



***DESCRIPTION**: For each ZERO (0.0) reading the user discovers "on or near" the invisible boundary of the gas-saturated area, a corresponding piece of a blue CONFIRMATION OUTLINE will appear (until the entire outline is completed). The outline for scenario 1 is comprised of 11 pieces. It takes but ONE ZERO (0.0) reading to activate the appearance of 1 of the 11 pieces. Each piece requires at least ONE uniquely-located bar hole and ZERO (0.0) reading to activate, thus, if a user bar holes and measures too closely to an existing ZERO (0.0) reading, then no additional piece to the outline will appear.*

DEVELOPERS:

Carefully read the description and review the visual aids.

The GREEN, YELLOW, and RED underground leak zones (comprised of one or more oval-shaped collision volumes) are invisible to the user and do not impede the user.

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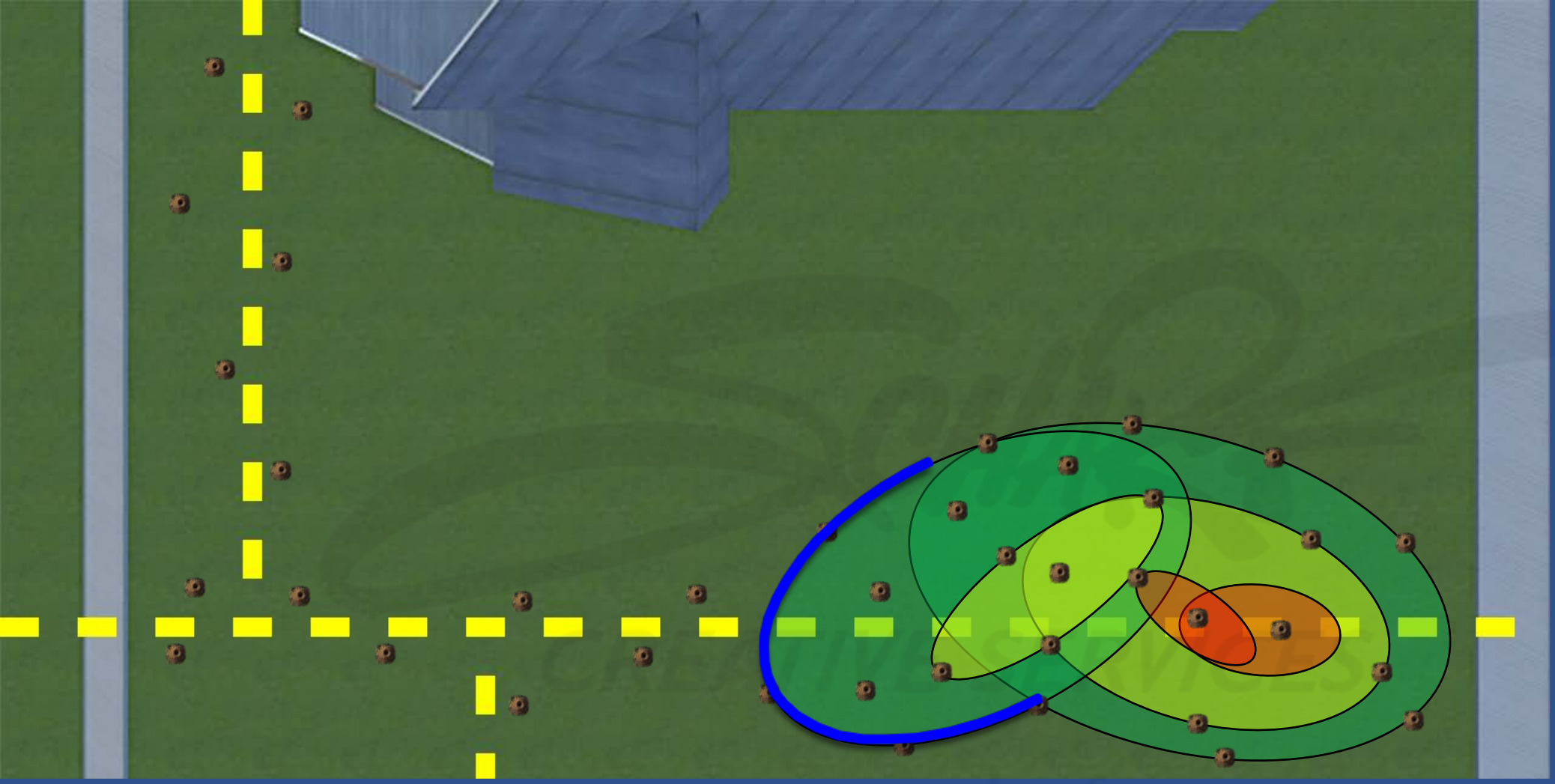

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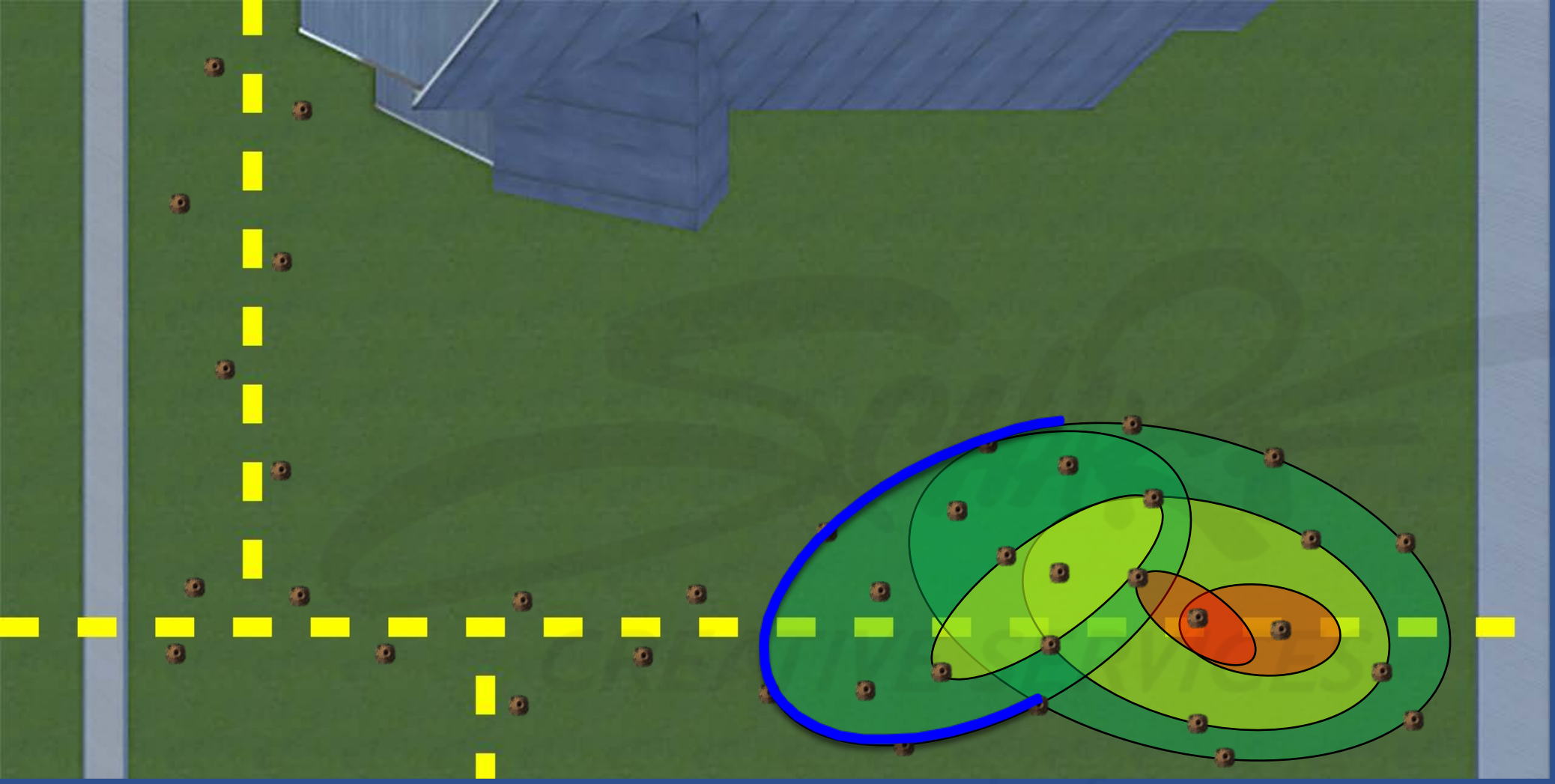

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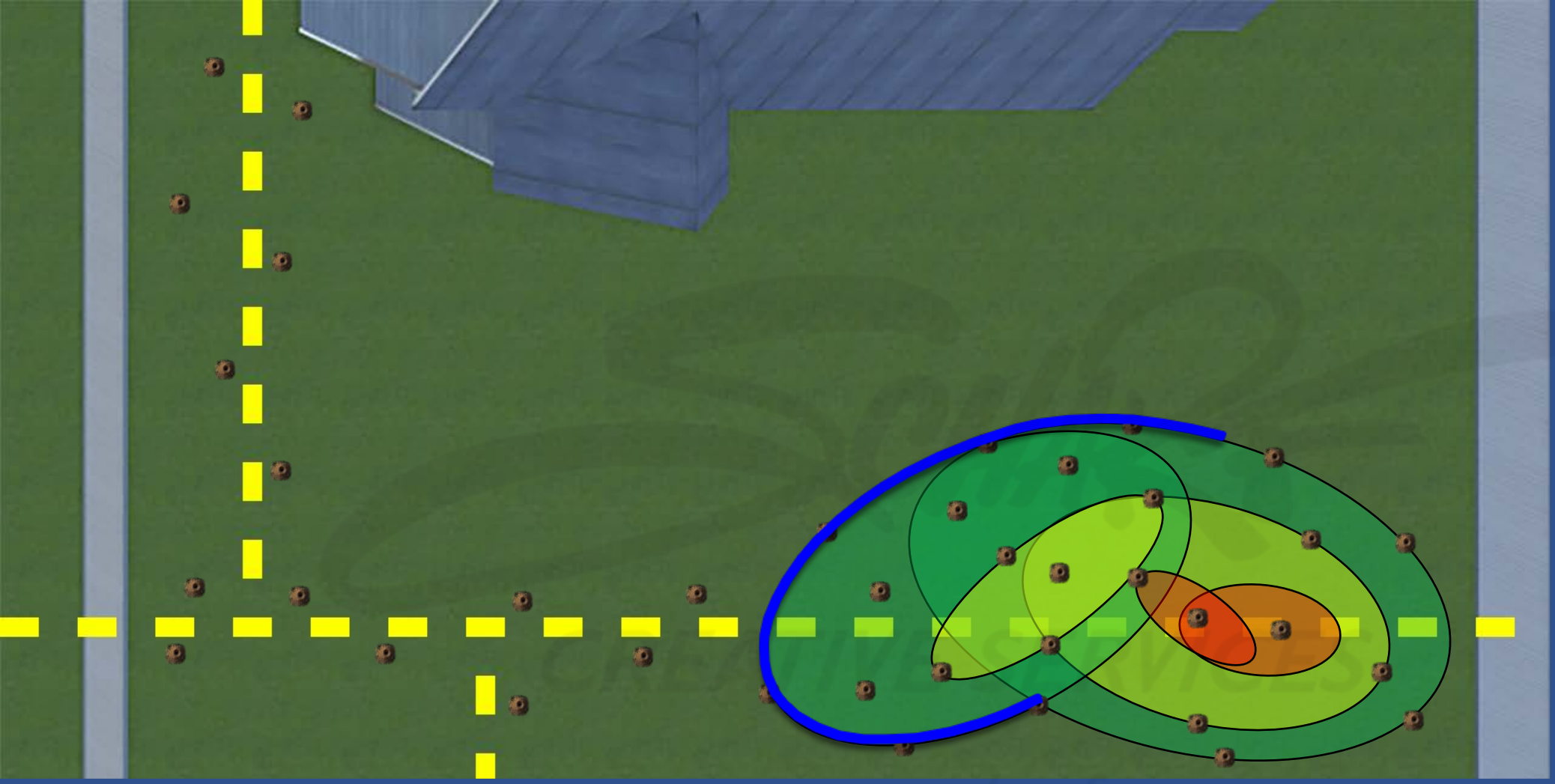

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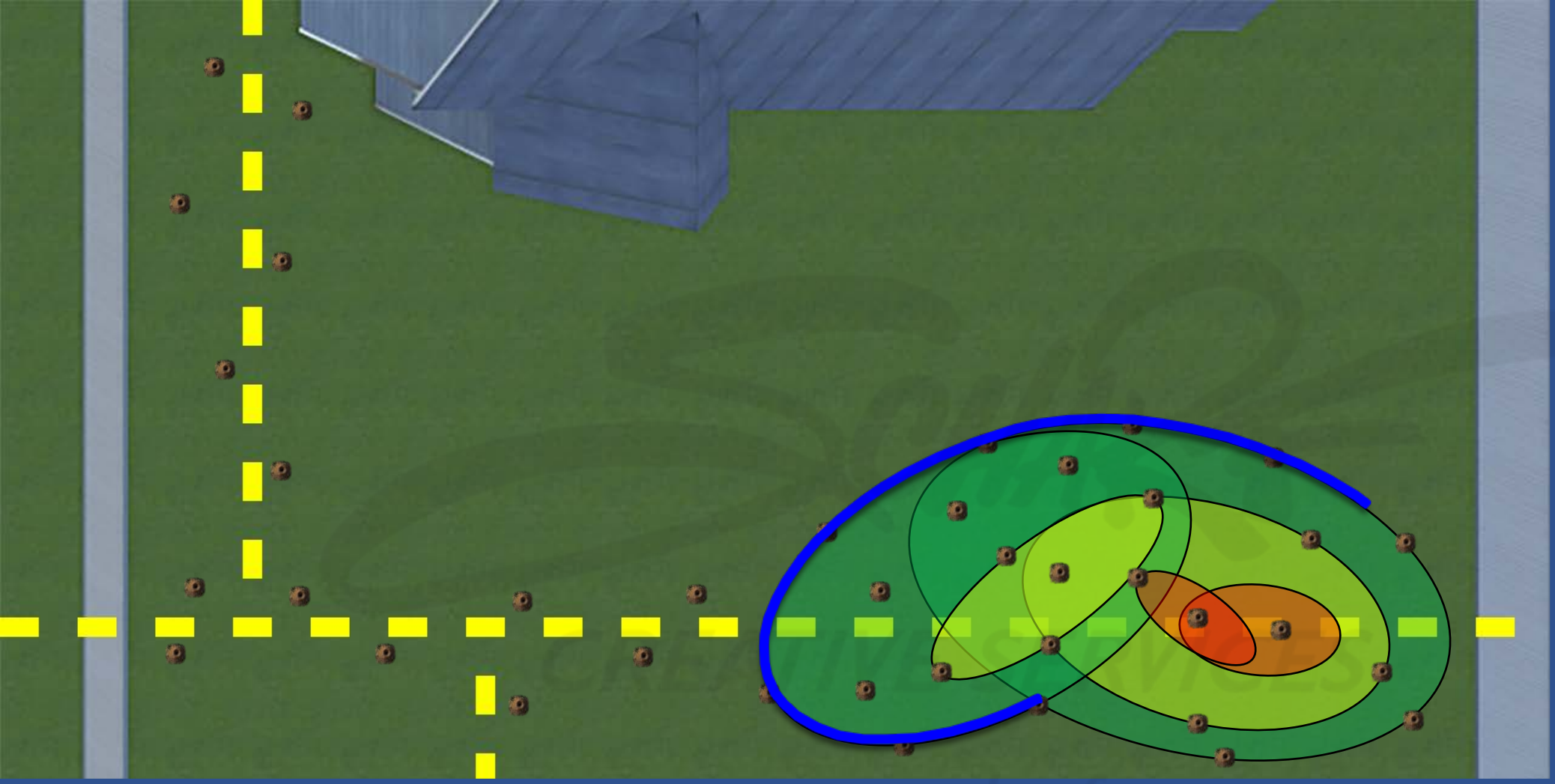

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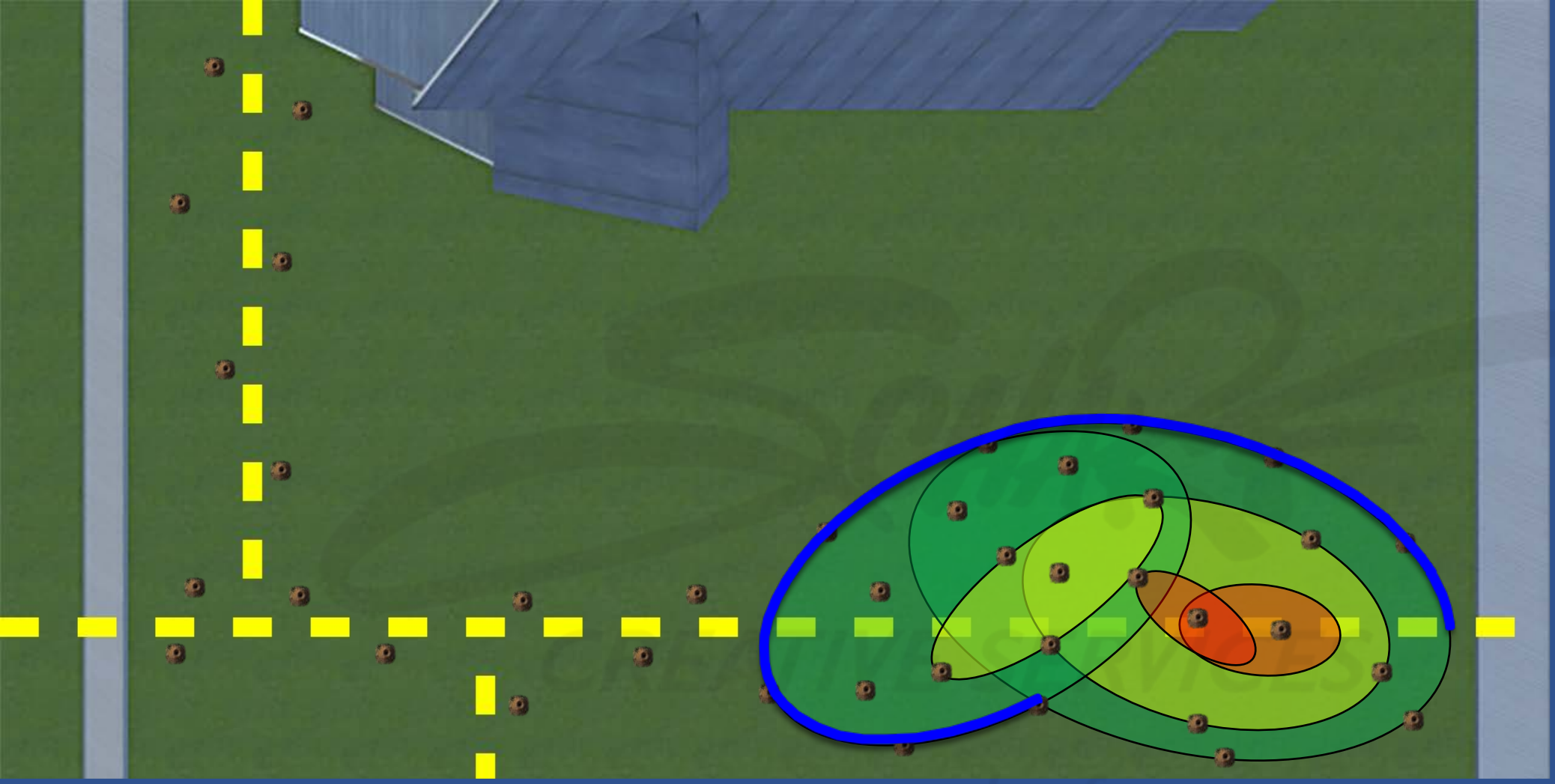

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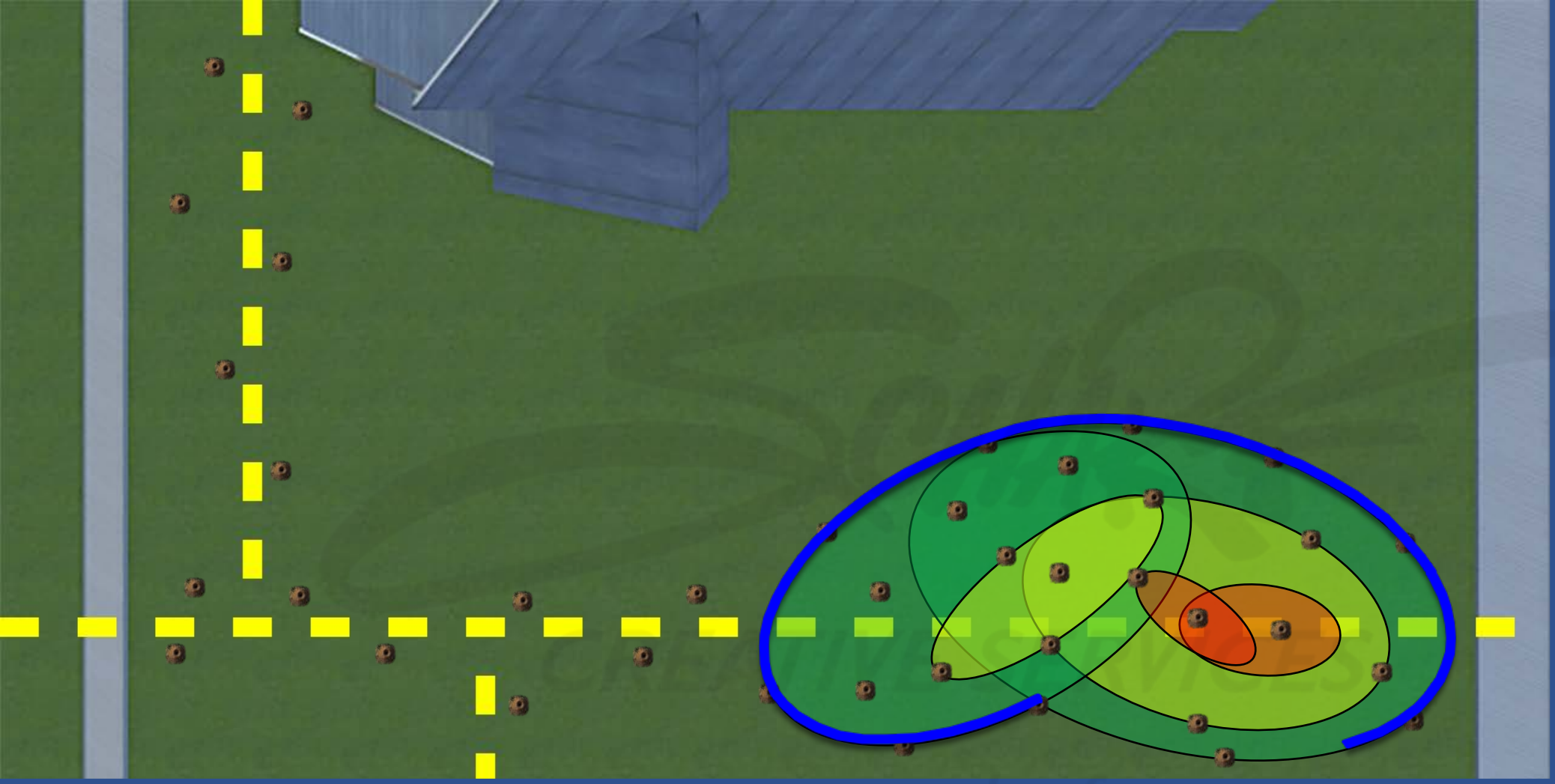

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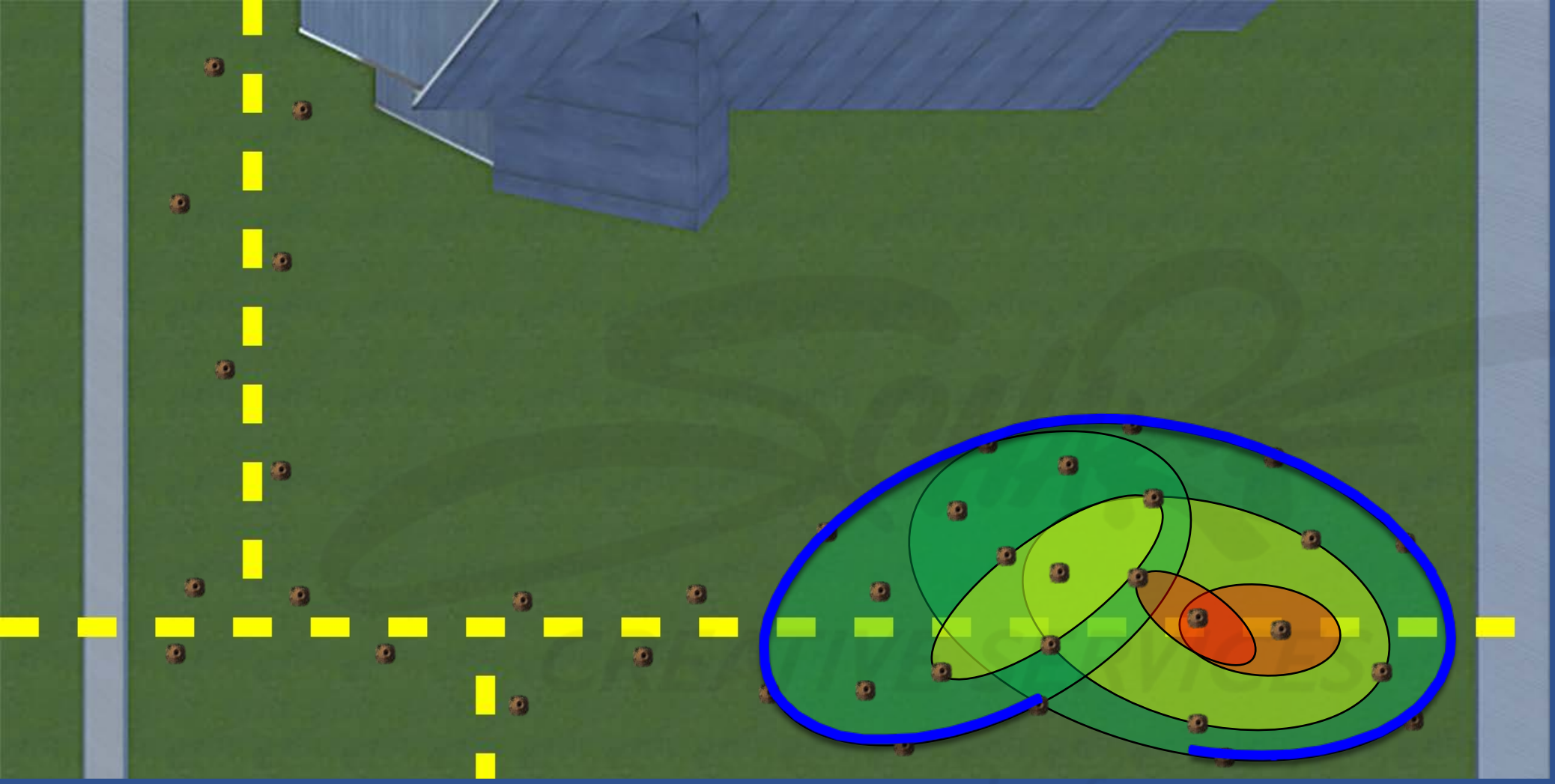

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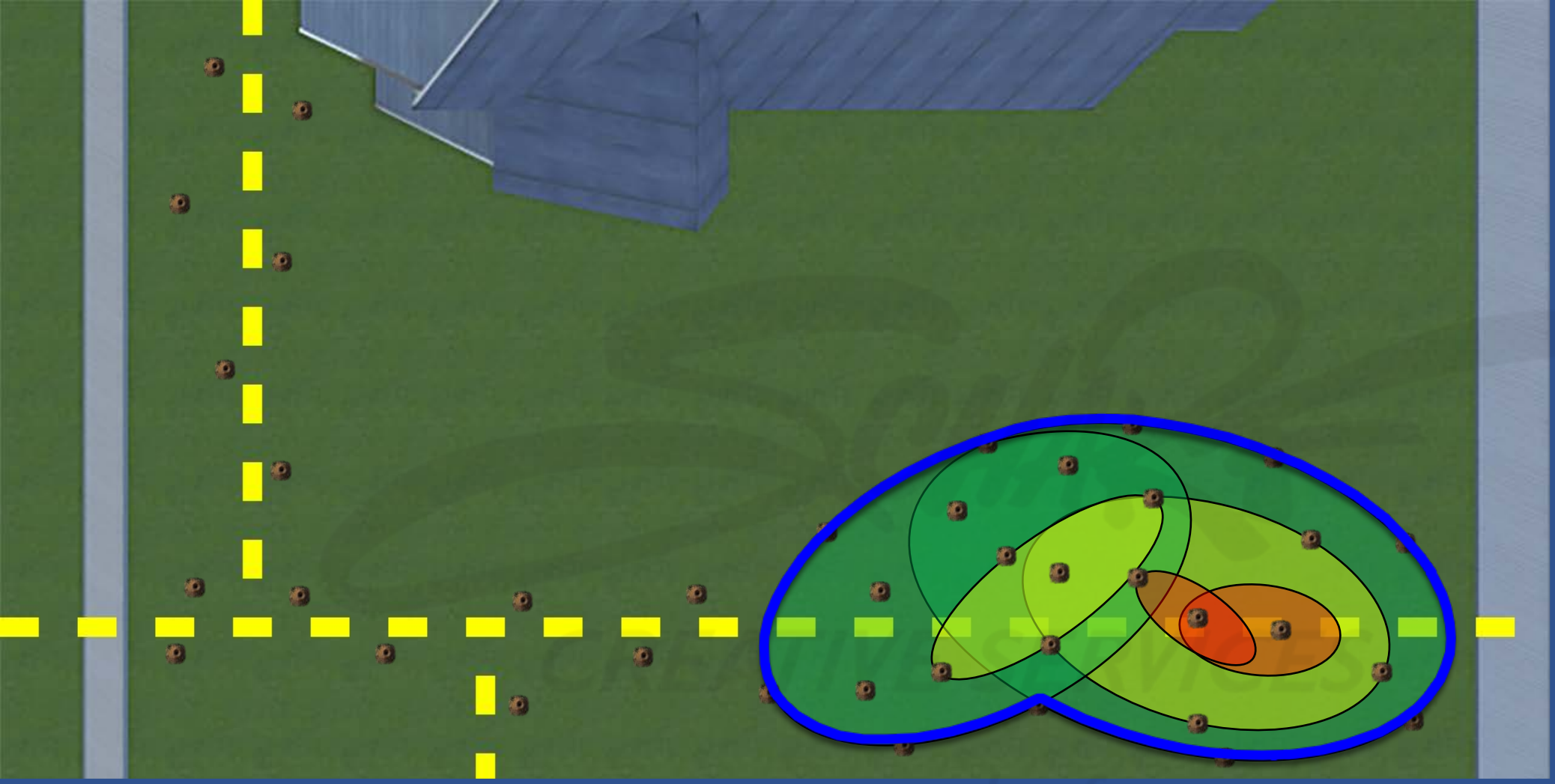

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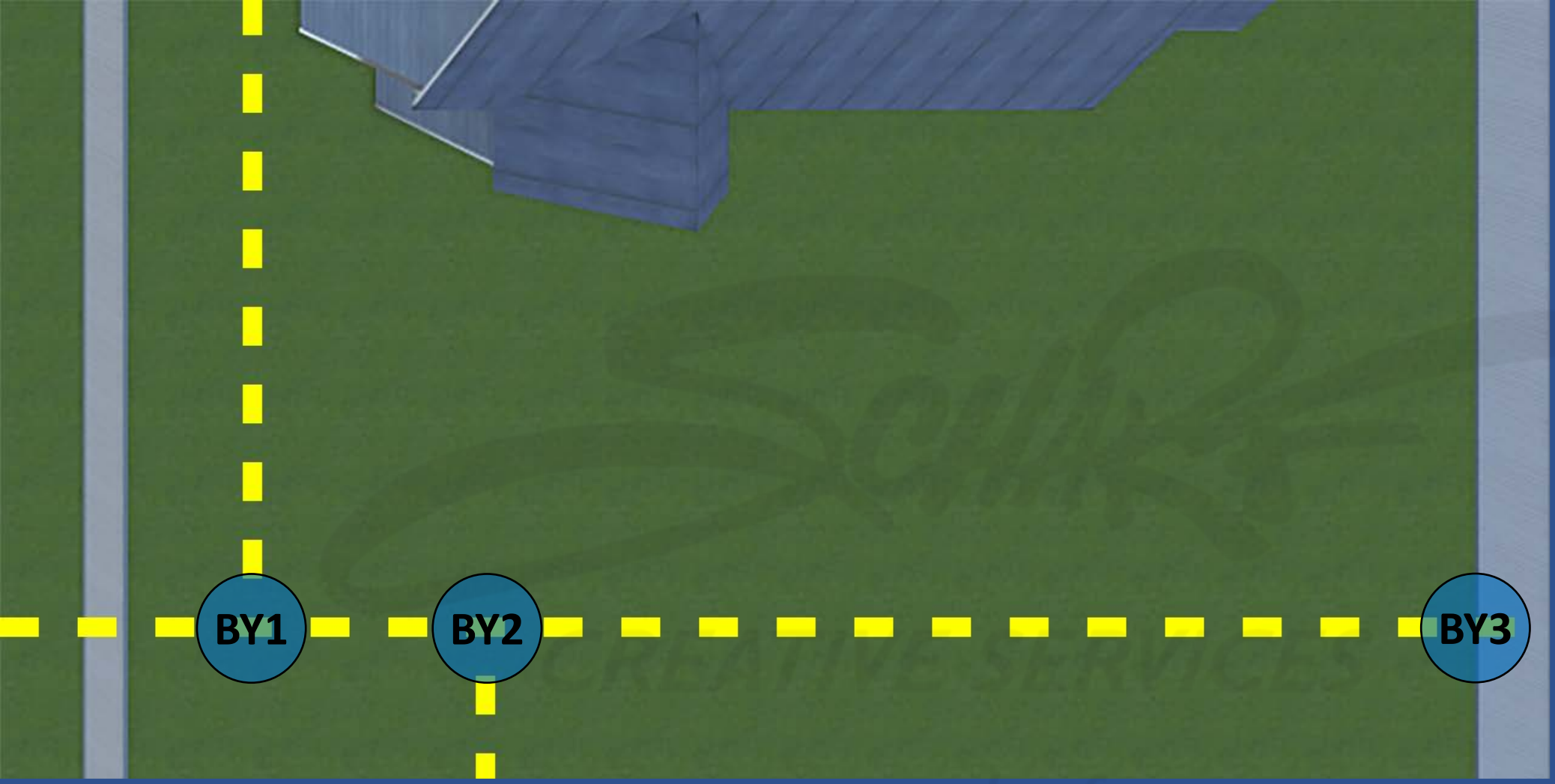

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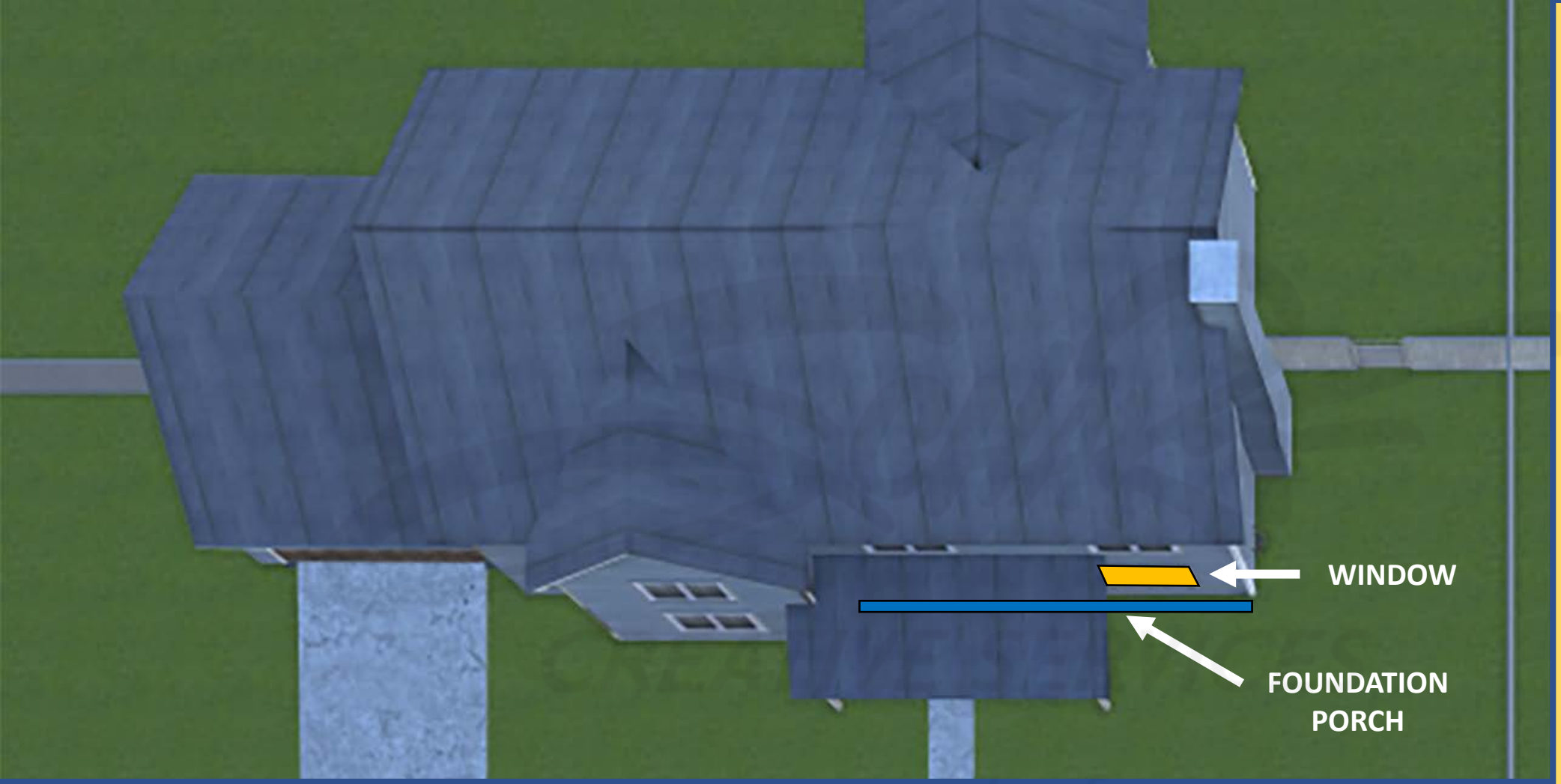

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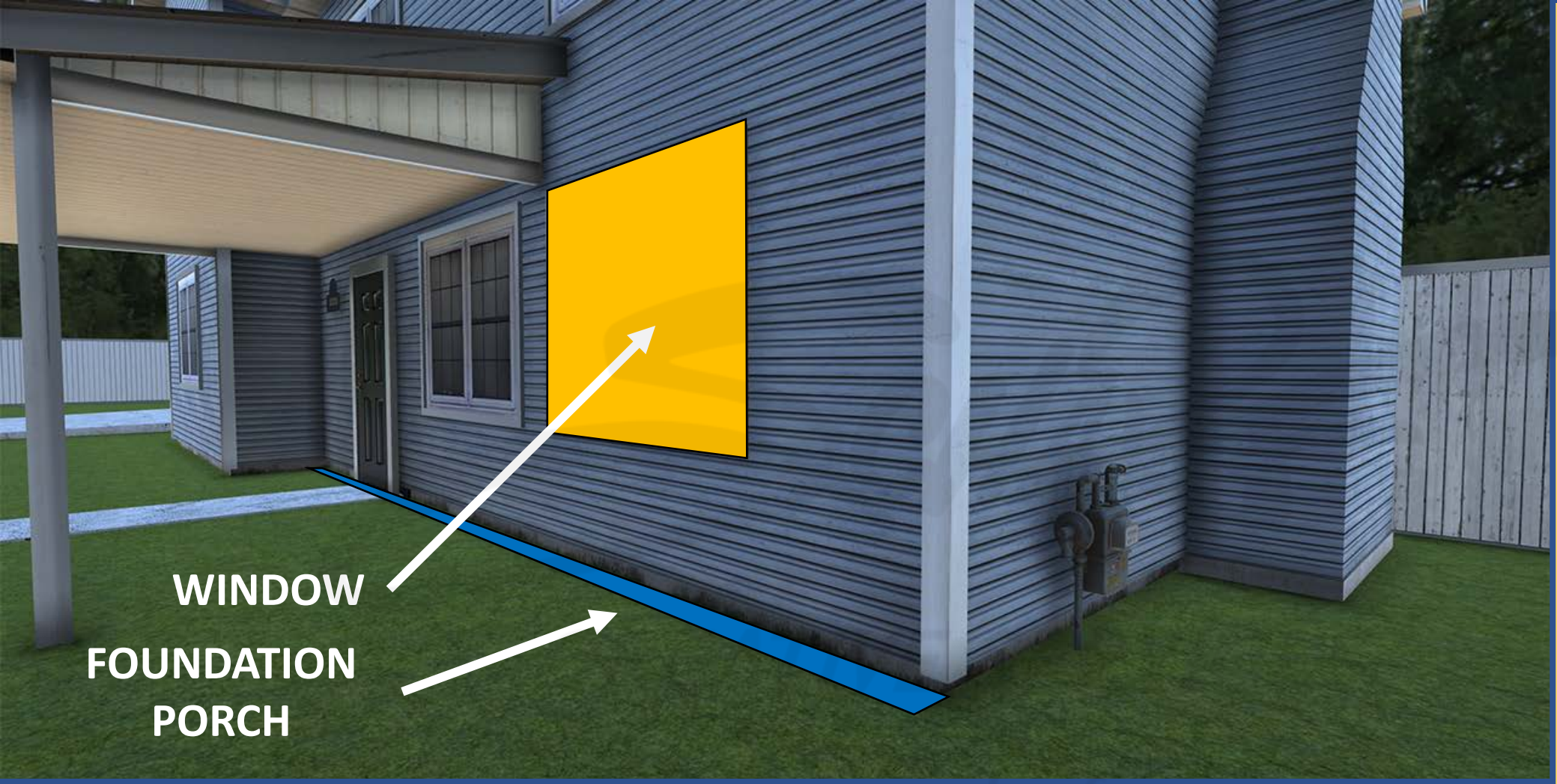

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Collision Volume

Requirements

CREATIVE SERVICES
www.emscharf.com

1) There is no home interior activity by the user within "Outside Leak Investigation." There should be no home interior components present or available within this project (to avoid negatively impacting APK framerate).

2) Even though each of the six scenarios are specific to six street addresses (and their customer avatars), the user CAN still navigate to ALL 10 homes within the neighborhood environment.

3) ALL 10 homes within the six scenarios require collision volumes for *ALL upright exterior surfaces* (e.g., front doors, back doors, fencing, fence doors, garage doors, porch railings, walls, and *individual* windows) with which the user can interact when navigating the neighborhood environment.

4) There must be no gaps between upright or navigable collision volumes.

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Leak Survey

Requirements

CREATIVE SERVICES
www.emscharf.com

Once a user has identified a leak source within a given scenario, real-world protocol requires that user to perform a LEAK SURVEY, involving the trackable investigation of one or more perimeter areas and surfaces (with which the following, specifically-named collision volumes should be associated within ENDEAVR user reporting).

Leak Survey – Back Yard 1 – Service Line to Main (conveyed as *BY1* within the storyboard)
Leak Survey – Back Yard 2 – Neighbor Tee (conveyed as *BY2* within the storyboard)
Leak Survey – Back Yard 3 – Downstream of Main (conveyed as *BY3* within the storyboard)
Leak Survey – Front Yard 1 – Service Line to Main (conveyed as *FY1* within the storyboard)
Leak Survey – Front Yard 2 – Upstream of Main (conveyed as *FY2* within the storyboard)
Leak Survey – Front Yard 3 – Downstream of Main (not conveyed within the storyboard)
Leak Survey – Foundation – Porch (conveyed as *FOUNDATION PORCH* within the storyboard)
Leak Survey – Foundation – South Wall (conveyed as *FOUNDATION SOUTH WALL* within the storyboard)
Leak Survey – Foundation – East Wall (not conveyed or used within the storyboard)
Leak Survey – Foundation – West Wall (not conveyed or used within the storyboard)
Leak Survey – Window (conveyed as *WINDOW* within the storyboard)

Please NOTE: FY1/FY2 and BY1/BY2 must always be a minimum of 25 feet apart.

3D Modeling

Modifications

CREATIVE SERVICES
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There are various homes – among the existing 10 homes within the "Inside Leak Investigation" neighborhood environment that is being reused for "Outside Leak Investigation" – which require additional optimizations and limited quality control modifications of 3D modeling, texture-mapping, scene lighting, collision volumes, and teleporters.

Optimization/Modification candidates include:

- Fencing (front yard, back yard, side yard).
- Rear surfaces of homes (doors, downspouts, gutters, roofing, walls, windows, and vegetation).
- Street address number placards.
- Fire truck.

CREATIVE SERVICES
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Scenarios

And Variables

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The scenario variables for the "Outside Leak Investigation" simulation will include some variables from the "Inside Leak Investigation" simulation.

The following *specifically-named* scenarios will be present for the simulation within ENDEAVR.

Scenario 1 – House 2326 in Front Yard
Scenario 2 – House 2331 in Front Yard
Scenario 3 – House 2329 in Back Yard
Scenario 4 – House 2325 in Back Yard
Scenario 5 – House 2323 at Gas Meter
Scenario 6 – House 2323 in Back Yard

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The following *specifically-named-and-defined* variables will be accessible to within ENDEAVR.

***PRE-EXISTING* VARIABLES AVAILABLE WITHIN *ALL* SIX SCENARIOS:**

VARIABLE NAME: Customer_Presence
VARIABLE NAME: Customer_Voice_Bubble_Statement
VARIABLE NAME: Fireman_VoiceBubble_Text

***NEW* VARIABLES *SPECIFIC TO* SCENARIO 5:**

VARIABLE NAME: Gas_Meter_Leak_Location_Service_Line
VARIABLE DEFINITION: Enable or disable the gas meter leak location on the gas meter service line.
USER ACTIVITY: The user can *choose* to detect the leak location with the standard SENSIT CGI, apply the spray bottle to confirm the leak, and close the gas meter shutoff valve with the wrench.

VARIABLE NAME: Gas_Meter_Leak_Location_Customer_Line
VARIABLE DEFINITION: Enable or disable the gas meter leak location on the gas meter customer line.
USER ACTIVITY: The user can *choose* to detect the leak location with the standard SENSIT CGI, apply the spray bottle to confirm the leak, and close the customer line shutoff valve with the wrench.

CHART SERVICES
www.emschart.com