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Summary Report for the Anti-Climb Coating Test Project: Simulated Attack and Skid-Resistance Tests

June 2020

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Acronyms and Abbreviations

°F	degrees Fahrenheit
APL	Applied Physics Labratory
DOS	Department of State
ft	foot
JHU	Johns Hopkins University
in.	inch
lb	pound
mph	miles per hour
PSCOE	Physical Security Center of Excellence
RP	Role Psisrelayer
temp.	temperature
TTP	tactic, technique, and procedure

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Executive Summary

The Sandia National Laboratories Physical Security Center of Excellence (PSCOE) has been tasked by the Department of State (DOS) Bureau of Diplomatic Security Research and Development branch to investigate the potential anti-climb benefits of newly developed skid-resistant paint coatings—one light base and one dark base. DOS is interested in studying the application of the coatings on passive barriers commonly used at diplomatic facilities.

The purpose of the anti-climb coating in this context is to deter and delay adversaries from climbing onto the passive barriers. PSCOE was tasked to perform delay testing that focused on the effectiveness of the coatings on the two DOS perimeter passive barriers—the DS-41 anti-ram fence and a 9 foot high by 1 foot thick reinforced concrete wall intended to mimic the DS-30 anti-ram perimeter wall. PSCOE was also tasked in performing skid-resistance testing using a British Pendulum skid-resistance tester. Delay testing and skid-resistance testing were also performed on two different passive barriers without any anti-climb coating to determine a baseline.

Testing comprised three scenarios. Scenario 1 involved one role player, Scenario 2 involved two role players, and Scenario 3 involved six role players. For delay testing, both light and dark anti-climb coatings were more effective on the passive barriers for Scenario 1 (one role player) as opposed to a passive barrier without anti-climb coating. The singule role player's time to defeat the various versions of the DOS picket fence was slightly longer with the light version of the picket fence, ultimately taking the longest to defeat, and the singule role player failed to defeat the light-coated concrete wall. For Scenario 2, the light and dark anti-climb coatings were more effective against two role players as opposed to a passive barrier without anti-climb coating. For Scenario 3, the coatings did not prove to be as effective against six role players, who could aid one another over the passive barriers with much less contact with the passive barrier.

Regarding skid-resistance testing, both light and coatings proved to be less skid-resistant than the perspective bare surfaces. The lowest skid-resistance numbers for both light and dark coatings were produced on the day after the delay testing had been performed. This result indicates that the performance of the coating has a marginal increase once individuals climb on the barriers.

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1.0 Introduction

1.1 Background

The Sandia National Laboratories Physical Security Center of Excellence (PSCOE) has been tasked by the Department of State (DOS) Bureau of Diplomatic Security Research and Development branch to investigate the potential anti-climb benefits of newly developed skid-resistant paint coatings. DOS is interested in studying the application of the coatings on passive barriers commonly used at diplomatic facilities.

This effort builds on previous research performed by Sandia in 2014 [1]. As part of that effort, two general coating classes were researched, including proprietary coatings specifically marketed as "anti-climb" or "anti-vandal" and other commercially available materials, such as surfactants, synthetic oils, waxes, lubricants, and petroleum jelly, that are not necessarily made for security applications but exhibited properties attractive for anti-climb coating purposes. The general finding of the research performed in 2014 concluded that the skid resistance of a coating lasted between 0–7 days. After 7 days, the skid resistance of the coated surface was reduced to a that of an uncoated surface.

Following the 2014 research, DOS worked with a subsequent research laboratory as well as commercial coating manufacturers to develop two new coatings specifically to improve the environmental persistence limitations noted in the 2014 effort. For this study, DOS has requested that PSCOE study the effectiveness of the two coatings on two passive barriers. The different coatings have been developed by Johns Hopkins University (JHU) and Watson Coating, Inc., and are referred to as dark base and light base anti-climb coating. The passive barriers these coatings were applied to include the DS-41 anti-ram fence and a 9 foot (ft) high by 1 ft thick reinforced concrete wall intended to mimic the DS-30 anti-ram perimeter wall.

1.2 Perimeter Barriers Tested

The two identified passive barriers include the DOS steel picket fence and a 9 ft high concrete wall. PSCOE, with the help of Sandia Department 6648, constructed the following versions of each passive barrier:

- Without coating
- With light coating, as shown in Figure 1
- With dark coating, as shown in Figure 2

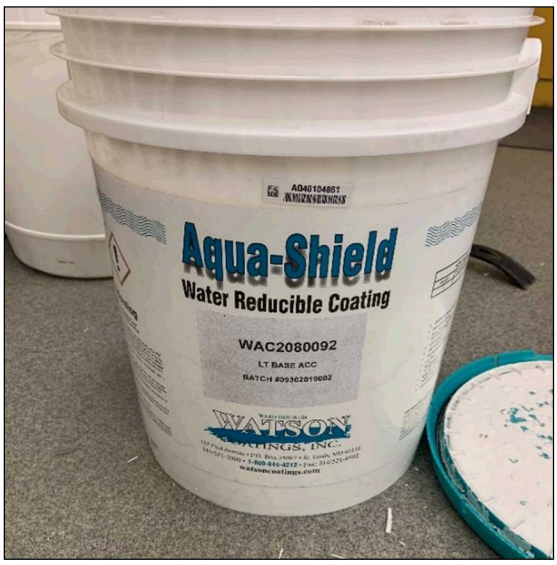

Figure 1. Light coating

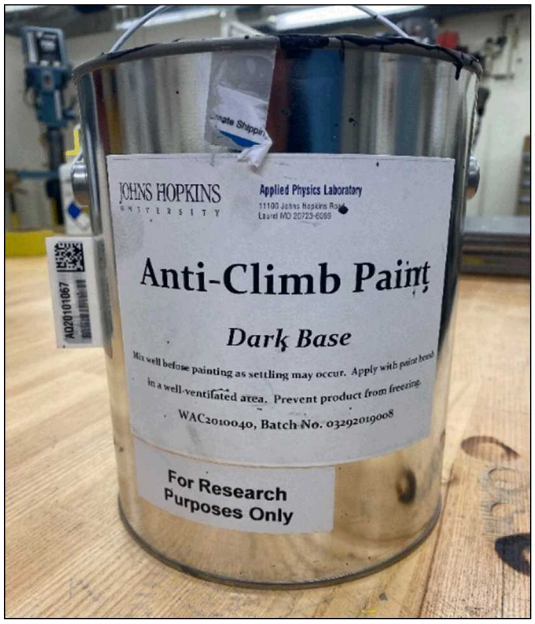

Figure 2. Dark coating

The DOS steel picket fence was fabricated by Sandia personnel using 4 × 2 × 1/4 inch (in.) steel tube members spaced 5 in. apart from one another, as specified in Appendix A, Sheet SK1. The concrete wall was a 10 × 9 × 1.5 ft pre-fabricated concrete panel manufactured by a local pre-caster. These dimensions were deemed acceptable by the stakeholders at the initial project kickoff meeting.

Each end of the passive barriers were secured to a stack of modular concrete blocks. The blocks, also referred to as deadman blocks, provided a rigid boundary condition to safely and securely attach the test barriers. This setup allowed for an efficient, modular approach that reduced setup and takedown times for each passive barrier test. The test setup for the uncoated steel picket fence within the stacked bloacks is shown in Figure 3.

Figure 3. DOS steel picket fence

Before the anti-climb coating was applied, the passive barriers were wiped clean, and a typical prime coat of paint was applied to serve as a base. Once the prime coat was applied, the passive barriers were then coated with the anti-climb coating using brush strokes that were parallel with a potential adversary climbing on the barriers (i.e., up and down). The light coating required several coats due to bubbling and sloughing issues during application on the DOS steel picket fence, as shown in Figure 4.

Figure 4. Light-base application issues on DOS steel picket fence

The application of the light coating on the concrete wall resulted in similar bubbling issues, so it was determined that it would be better suited to apply the light coating on the concrete wall with a roller, as shown in Figure 5. Although a roller was used, the coating was still applied using strokes that were parallel with a potential adversary climbing on the barrier.

Figure 5. Application of light base coating on concrete wall

There were no issues in applying the dark coating on any of the passive barriers. Once the coatings dried, the passive barriers that were coated with the light coating were then scuffed with a commercial scuffing pad. The scuffing of the light coating was determined by past performance results from JHU testing.

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2.0 Anti-Climb Coating Delay Testing

2.1 Delay Testing Scenarios

The purpose of the delay testing was to evaluate the anti-climb coating effectiveness against specified scenarios, as described Table 1.

Table 1. Testing scenario details

Scenario Element	Scenario #1	Scenario #2	Scenario #3
Number of Role Players	1	2	6
Intent	Climb	Climb	Climb
Equipment	None	None	None
TTP	None	Buddy Lift/Pull	Buddy Lift(s)/Pull(s)
Sophistication: Novice–1, Knowledgeable–2, Expert–3	1	1	1

Teams were asked to attempt a specified attack scenario prior to gaining knowledge of the barriers and anti-climb coating. The scenarios were documented using photography and videography.

2.1.1 Delay Testing Participants

All role players participating as potential adversaries were deemed fit by novice criteria. For this testing, novice criteria was defined as an individual between the ages of 18 and 45 years old, in satisfactory physical health, and with no prior significant experience scaling vertical elements, either in a professional (e.g., military training) or hobby (e.g., mountain climbing) capacity.

All role players were given an identifier to avoid the use of personal proprietary information. An example of this identifier includes Role Player (RP) 3-4; this particular identifier specifies that this role player is part of Scenario 3 and is the fourth role player participating in the scenario. Biometric data of each participant was captured, as shown in Figure 6, and are listed in Table 2. Grip strength was measured using an electroncic hand dynamometer.

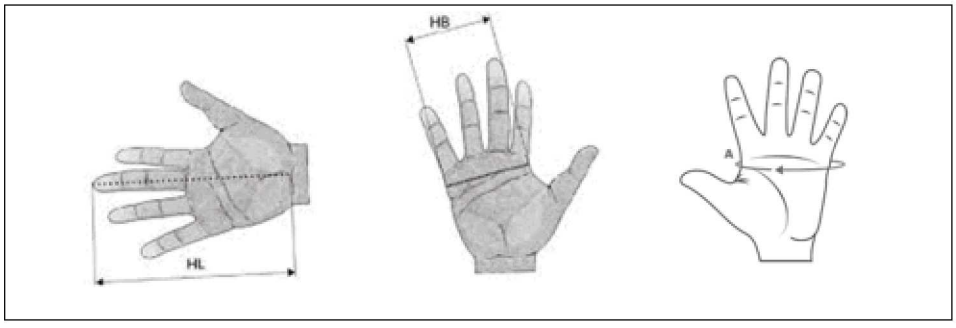

Figure 6. Hand biometric measurement guide

Table 2. Role player biometrics

Role Player Identifier	RP 1-1		RP 2-1		RP 2-2		RP 3-1		RP 3-2		RP 3-3		RP 3-4		RP 3-5		RP 3-6	
Gender	Male		Male		Male		Male		Male		Male		Female		Male		Male	
Age (years)	30		22		23				25		38		31		27		41	
Height	5 ft 10 in.		5 ft 7 in.		5 ft 7 in.		6 ft 3 in.		5 ft 7 in.		6 ft 1 in.		5 ft 8 in.		5 ft 6 in.		6 ft 2 in.	
Weight (lb)	185		175		155		195		190		200		150		175		190	
	L	**R**	**L**	**R**	**L**	**R**	**L**	**R**	**L**	**R**	**L**	**R**	**L**	**R**	**L**	**R**	**L**	**R**
Grip strength (lb)	111.2	137.2	80.4	90.6	114.4	117.2	93.6	90	125.6	133.6	114.2	155.4	96.8	91.2	115	136	101.4	135.6
Hand length (in.)	7-1/8	7-1/8	6-7/8	7-0	7-3/8	7-0	7-3/8	7-5/8	7-5/8	7-1/12	8-0	8-0	7-0	7-0	7-0	6-7/8	7-1/2	7-5/8.
Hand breadth (in.)	3-3/4	3-1/2	3-1/4	3-1/4	3-1/2	3-3/8	3-1/2	2-1/2	3-1/2	3-1/2	3-7/8	3-7/8	3-0	3-0	3-1/2	3-3/4	3-1/2	3-5/8
Hand circumfere-nce (in.)	8-3/8	8-1/4	7-5/8	7-5/8	8-1/16	7-7/8	8-3/8	8-1/8	8-1/8	8-3/8	8-1/8	9-1/2	7-1/2	7-5/8	8-3/16	8-3/8	8-1/2	9-0

2.1.2 Delay Testing Results

All three scenarios were similar in that each included novice-level role players, no tools were involved, and a maximum of 20 minutes were allotted to complete the task. The differences in the scenarios included the number of role players attempting to defeat the barrier. Scenario 1 included one role player, Scenario 2 included two role players, and Scenario 3 included six role players.

Each scenario was tested on all six passive barriers constructed and as described in Section 1.2 above. The barriers, without any anti-climb coating applied to them, were tested first, the barriers with the dark anti-climb coating applied were tested second, and the barriers with the light anti-climb coating applied were tested third. The results of these tests are shown in Figure 7 and listed in Table 3.

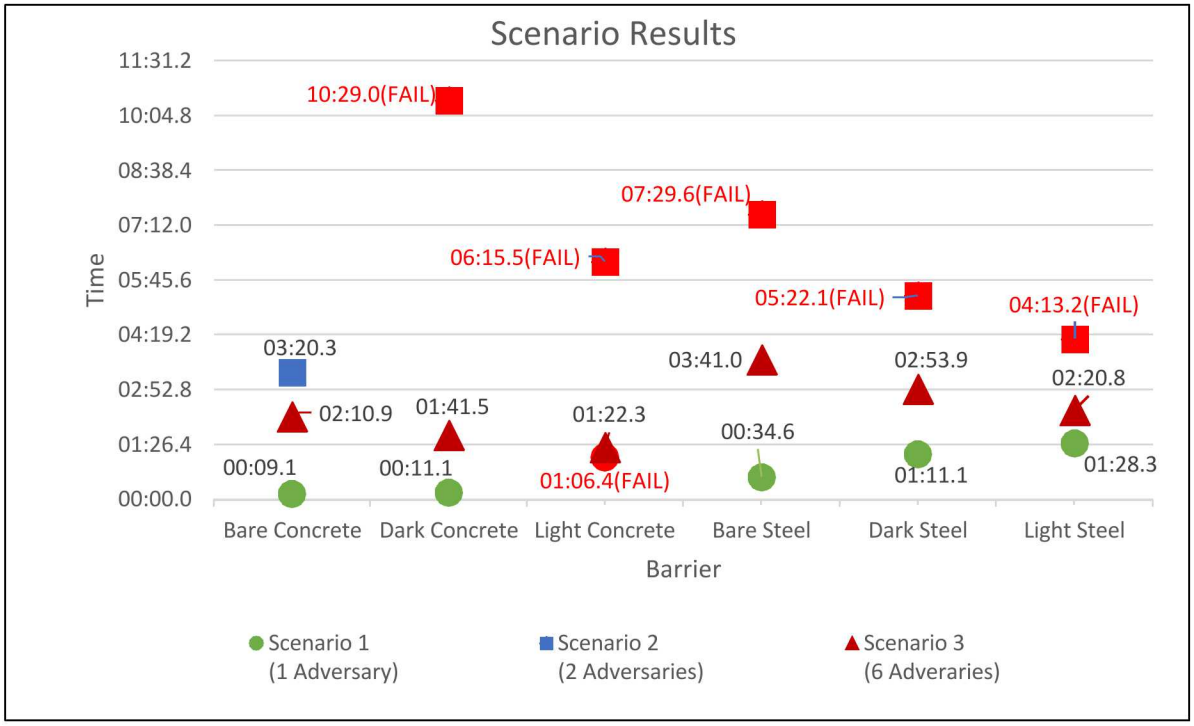

Figure 7. Delay testing results

Table 3. Delay testing results

Scenario 1 (One Adversary)			Scenario 2 (Two Adversaries)			Scenario 3 (Six Adversaries)		
Bare Concrete	**Dark Concrete**	**Light Concrete**	**Bare Concrete**	**Dark Concrete**	**Light Concrete**	**Bare Concrete**	**Dark Concrete**	**Light Concrete**
00:09.1	00:11.1	01:06.4 (Fail)	03:30.3	10:29.0 (Fail)	06:15.5 (Fail)	02:10.9	01:41.5	01:22.3
Bare Steel	**Dark Steel**	**Light Steel**	**Bare Steel**	**Dark Steel**	**Light Steel**	**Bare Steel**	**Dark Steel**	**Light Steel**
00:34.6	01:11.1	01:28.3	07:29.6 (Fail)	05:22.1 (Fail)	04:13.2 (Fail)	03:41.0	02:53.9	02:20.8

The Scenario 1 role player was able to defeat all of the passive barriers except for the concrete wall, which had the light base anti-climb coating applied to it. The Scenario 2 role players failed to defeat all of the passive barriers except for the concrete wall, which did not have any of the anti-climb coatings applied to it. The Scenario 2 role players did, however, manage to get one role player over the wall on all of the failed scenarios. The Scenario 3 role players were able to defeat all of the passive barriers.

2.2 Scenario Methods and Observations

The role players participating in the delay testing were all deemed novice role players and had no prior knowledge about the passive barriers for which they were asked to defeat. The novice knowledge of the role players led to different techniques used in attempts to defeat the passive barriers. Some methods and observations of each of the scenarios are detailed in Sections 2.2.1–2.2.4. A timeline of noteworthy scenarios is provided in Appendix C.

2.2.1 Scenario 1

The Scenario 1 role player's method of defeating the steel barriers was to clamp his feet around the beam and lunge upward toward the top of the barrier, as shown in Figure 8. Once the role player was able to reach the top of the barrier, he was able to pull himself up and over. This technique was successful on all of the steel barriers.

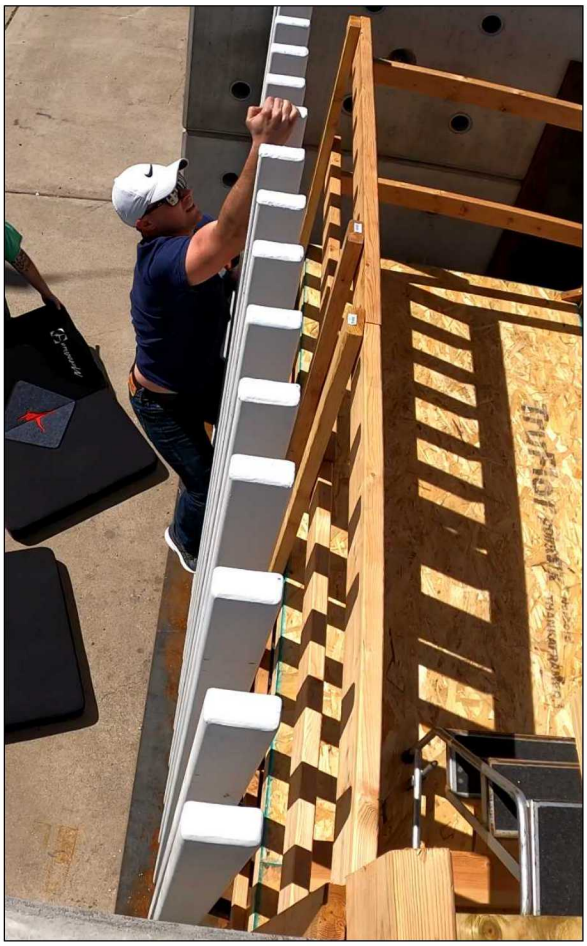

Figure 8. Scenario 1 role player attempting to defeat the light base picket fence

The Scenario 1 role player's method of defeating the concrete barrier was to use a running start and jump on to grab the top of the wall. Once the role player had adequate grip on the top of the wall, he was able to pull himself over the barrier, as shown in Figure 9. This technique was successful on the bare concrete wall and the dark-coated wall, but it was ineffective on the light-coated wall. When asked why the role player's technique did not work on the light concrete wall, the role player responded that it was too slippery, and he could not grip the top of the wall.

Figure 9. Scenario 1 role player attempting to defeat the dark base concrete wall

2.2.2 Scenario 2

The Scenario 2 role players attempted several different techniques to defeat the steel barriers. On the bare steel barrier, the role players tried to each defeat the steel barrier solo, but this led to only one role player defeating the barrier, which was deemed a fail. When confronted with the dark and light steel barriers, the technique they used was to have one role player climb onto the other role player's shoulders. This technique made it possible for the one role player to climb over the wall. The role player then left behind attempted to climb over the barrier solo but was unsuccessful. When asked why the role player was able to solo the bare steel but was not able to climb without assistance on the light or the dark coatings, the role player responded that the surface was too slick, and his shoes and hands could not grip.

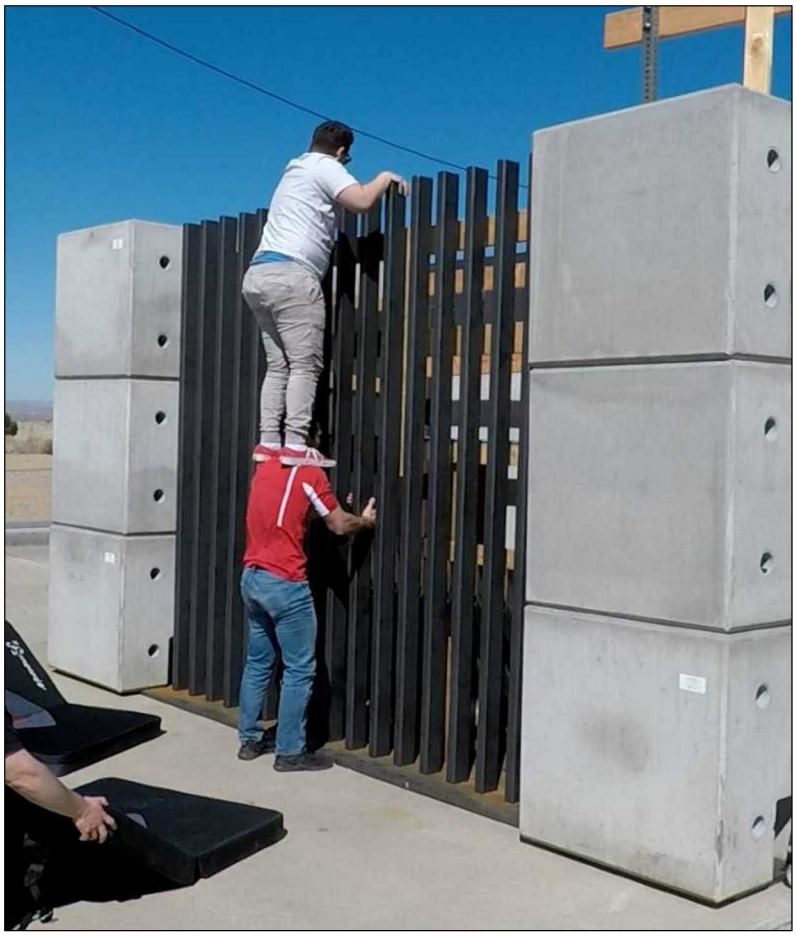

Figure 10. Scenario 2 team attempting to defeat the dark-coated picket fence

The Scenario 2 team's technique for defeating all barriers was to attempt different types of lifts to hoist one role player on top of the barrier. Once one of the role players was on top of the barrier, the role player would then drop their leg down for their partner to grab onto and climb up, as shown in Figure 11. This technique was only successful on the bare concrete scenario. When asked why they were not successful on the dark coated concrete wall, one of the role players responded that it was too slick and his shoes kept slipping. When asked why they were not successful on the light-coated concrete wall, one of the role players responded that he was unable to grip the top of the wall, and when his partner grabbed his leg to climb up, he felt as though he was going to be pulled off the wall.

Figure 11. Scenario 2 team attempting to defeat the bare concrete wall

2.2.3 Scenario 3

The Scenario 3 team used a series of teamwork techniques to defeat all of the passive barriers. Their strategy was to hoist two role players on top of the barrier to help the others over. This tactic was achieved by having one role player kneel on his hands and knees on the ground, which allowed the others to use him as a stepping stool, as shown in Figure 12. Once all other role players were over the barrier, the two role players on top of the barrier then helped the last role player over, as shown in Figure 13.

Some of the role players were wearing belts, which was useful for team members to grab ahold of them and pull them over the barrier. The Scenario 3 team was able to defeat the barriers quicker each time they attempted the task. When asked how this efficiency was possible, one role player responded that they had developed a process, and each time they attempted to defeat a barrier, they were able to refine and ensure the process more productive.

Figure 12. Scenario 3 team attempting to defeat the light-coated picket fence

Figure 13. Scenario 3 team attempting to defeat the light-coated picket fence

2.2.4 Scenario Difficulty

The role players were asked to reply to a series of questions. Among the questions, the role players were asked to rate the level of difficulty to climb the barrier on a scale of one through five and described as the following: 1–very easy, 2–easy, 3–moderate, 4–difficult, and 5–very difficult. Figure 14 shows a graph of respondents' answers.

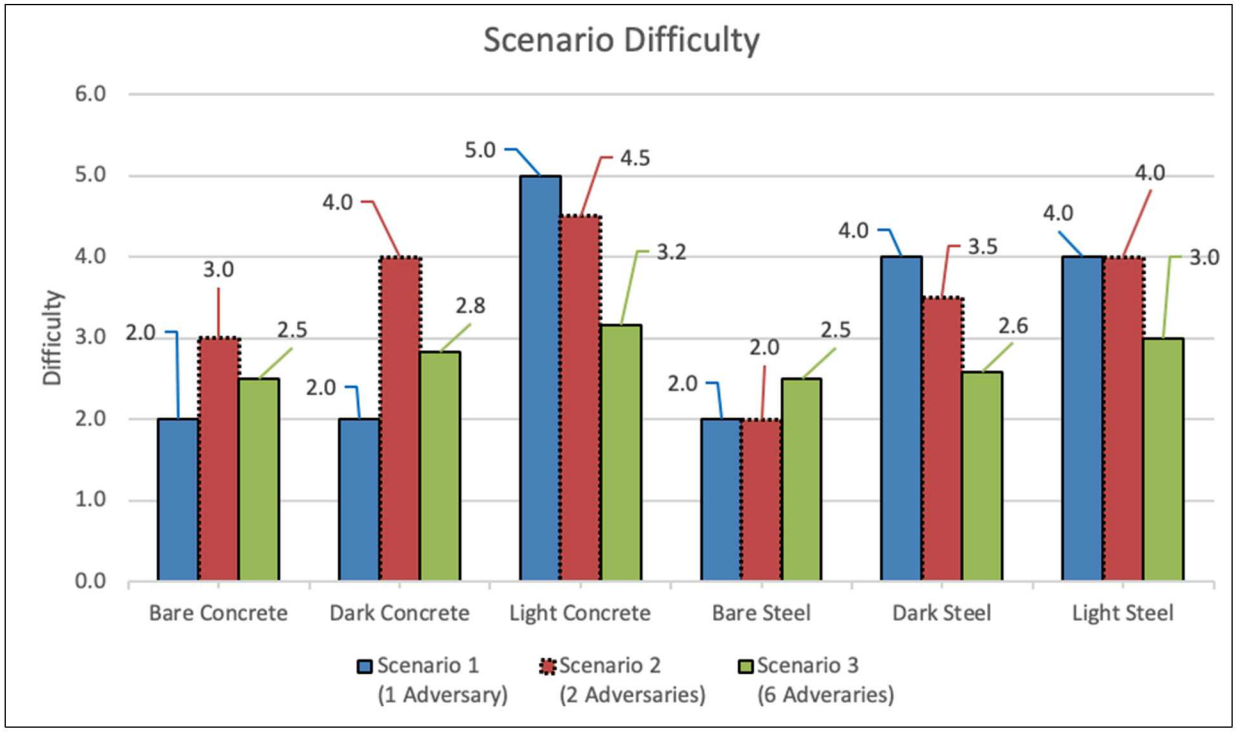

Figure 14. Scenario difficulty

When the role players were asked to rate the level of difficulty for each scenario, the responses varied from each role player. The full survey responses are detailed in Appendix D. Noteworthy responses include the following:

- Regarding dark concrete, one role player noted the wall had a slippery surface, it was hard to grip, and their feet would not stick.
- Regarding the light concrete, one role player noted that the surface was extremely slippery and was significantly slicker than the other surfaces.
- Regarding dark steel, one role player noted that the surface seemed taller and slicker. Additionally, the barrier was smooth and did not allow for any grip.
- Regarding light steel, one role player noted that the barrier was more slippery than the others, and it made the task of climbing over the barrier more difficult.

2.3 Anti-Climb Coating Sloughing

Before and after each scenario, photos were taken of the role players' hands and feet to see if there would be any type of shedding of the coatings. The most noticeable sloughing of the coating was from the dark steel, as shown in Figure 15.

Figure 15. Role player hands before and after attempting to defeat the dark-coated picket fence

The light coating also had some noticeable sloughing, as shown in Figure 16.

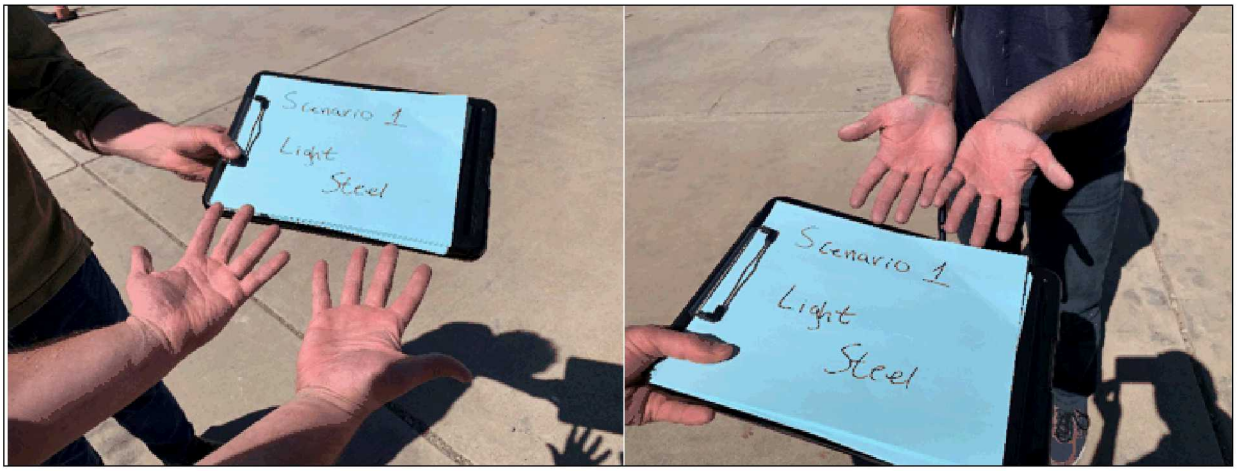

Figure 16. Role player hands before and after attempting to defeat the light-coated picket fence

Once all delay testing had been performed on the dark-coated concrete wall, it was noticeable that sloughing of the coating had occurred. The wall had various skid marks, and the coating had been worn down from the role players trying to climb the barrier, as shown in Figure 17.

Figure 17. Dark-coated concrete wall after testing had been performed

During test planning discussions, it was noted that both the light and dark coatings would slough after application to a surface. The question was asked whether the sloughing action of the coating could stain clothing if someone were to inadvertently touch or graze a coated wall. To research potential sloughing for the dark-coated coating only, a white T-shirt was intentionally rubbed against a coated DS-41 steel tube member. The T-shirt was washed in a front-load washing machine using cold water with other clothing to constitute a full load, then subsequently dried. No pre-treatment of the stained area was performed. After drying, the stain was still evident, although the area was reduced in size.

Figure 18 shows the white T-shirt being rubbed on the dark-coated DS-41 steel tube surface. Figure 19 shows the extent of the dark coating stain on the T-shirt. Figure 20 shows pre- and post-wash views.

Figure 18. Rubbing a white T-shirt on the dark-coated surface of a DS-41 steel tube member

Figure 19. Transposed dark coating stain on the white T-shirt

Figure 20. Pre- and post-wash views of the dark coating stain on a white T-shirt

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3.0 Skid-Resistance Testing

3.1 Test Coatings and Materials

The two materials used for skid testing included steel beams, as detailed in Appendix A, Sheet SK1, and a pre-fabricated concrete wall. It should be noted that the skid tests were performed on the same test samplings used in the delay testing. Each of these testing materials were then coated with anti-climb coating referred to as a light base and dark base, as shown in Figure 21 and Figure 22, respectively.

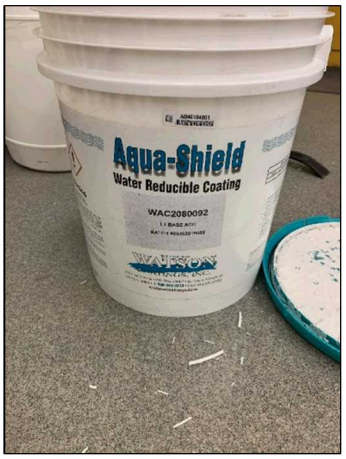

Figure 21. Light base

Figure 22. Dark base

The dark base coating was prepared by JHU/APL and the light base was prepared by Watson Coatings, Inc.

Figure 23 shows the light base coating being applied to the steel beams.

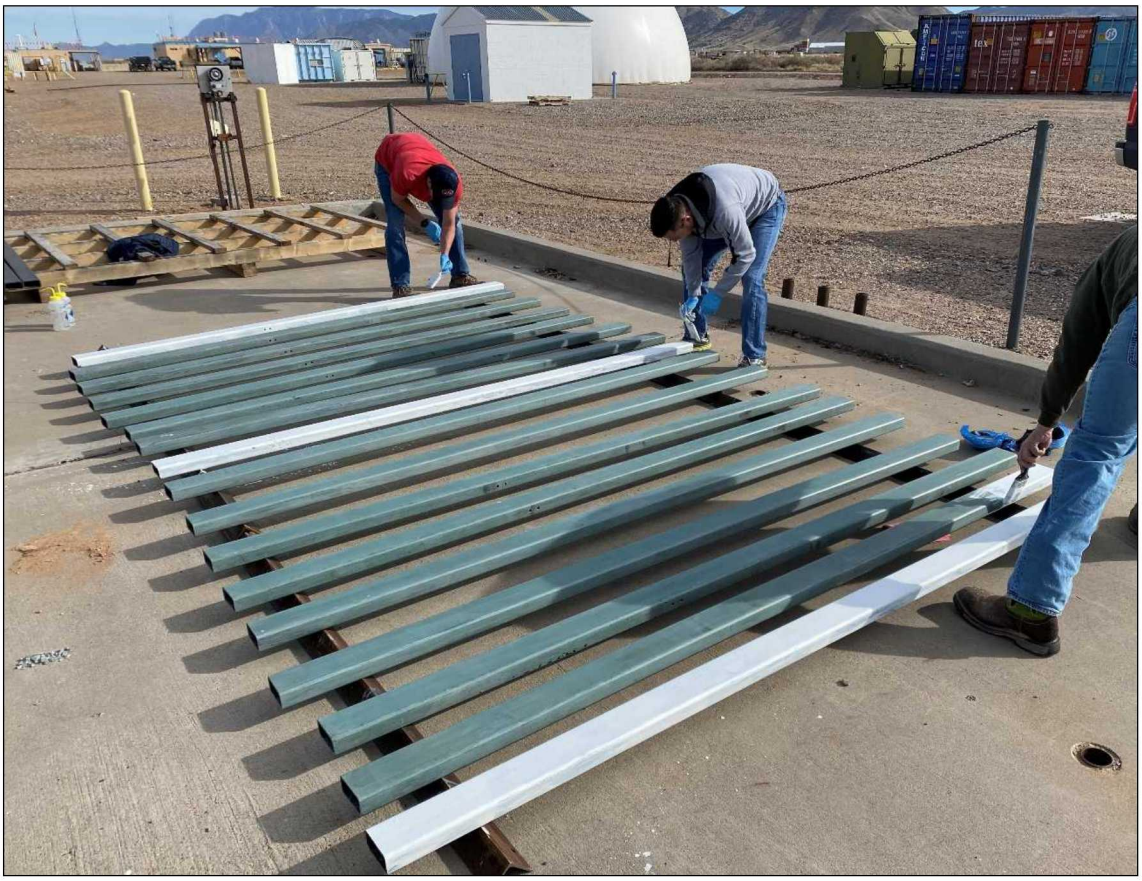

Figure 23. Light-base steel beam coating application

Figure 24 shows the dark base steel beams with coating applied.

Figure 24. Dark-base steel beam coating application

Figure 25 shows the light base coating being applied to the concrete wall.

Figure 25. Light-base coating application

Figure 26 shows the concrete wall with the dark base coating applied.

Figure 26. Dark base concrete wall coating application

The test material consisted of a concrete wall and steel beams. There were three different test mediums: bare (none), light coating, and dark coating.

The samples were tested outdoors in fair conditions, and as listed in Table 4.

Table 4. Weather history for skid-resistance testing

Date	Day Average Temp. (°F)	Precipitation (in.)	Maximum Wind Speed (mph)
03/04/2020	47.75	0.00	12
03/11/2020	55.04	0.00	15
03/16/2020	53.54	0.00	12
03/17/2020	56.29	0.00	28

For skid-resistance testing, the steel beam and the concrete wall were tested during a 24 hour period after coating, then tested again 7 days from the initial test date. The samples were skid-tested prior to the exercise being performed and again the following day after the exercise had concluded. The steel beams and concrete wall samples were aligned horizontally on the ground with the pendulum apparatus on top, as shown in Figure 27 and Figure 28. This setup was performed for all three scenarios: bare (control unit), light coating, and dark coating. The pendulum tester had been set up and calibrated per manufacturer instructions to ensure that the method of measurement for each sample was consistent. Prior to measuring the skid resistance of the respective test samples, the calibration of the pendulum was verified each day of

testing. The distance between the pendulum rubber slider and the individual sample surfaces remained consistent throughout the test sessions. Figure 27 shows the pendulum test apparatus.

Figure 27. Typical steel beam skid-resistance measurement setup

Figure 28. Typical concrete skid-resistance measurement setup

3.2 Skid-Resistance Test Results

The results for the coated steel surfaces showed that both of the coatings exhibited values of skid resistance below that of the bare steel surface for each test. The two coatings made the steel surface slicker than the bare steel surface for all 4 days. Test results showed that the two types of coatings are less skid-resistant than the bare steel surface, and the dark-coated steel was less skid-resistant than the light-coated and bare-steel surfaces. Figure 29 shows skid resistance over time for the steel test scenarios.

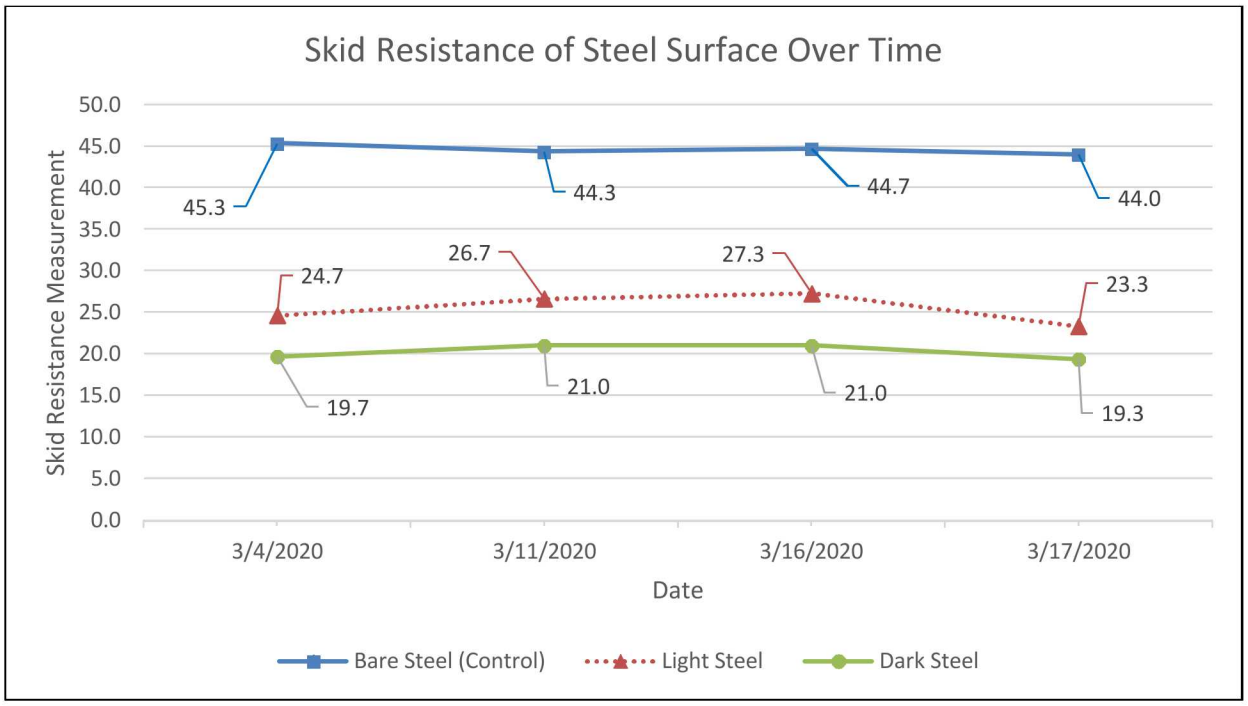

Figure 29. Skid resistance of steel surfaces over time

Compared to the coated-steel test series, the skid-resistance values for the coated concrete surfaces were higher and more constant with each type of coating. The similarity of the points can attribute to the porous texture of the concrete compared to the smoother steel substrate. Similar to the steel testing, the dark coating was less skid resistant than the light coating. Figure 30 shows the skid-resistance results over time for the concrete test scenarios.

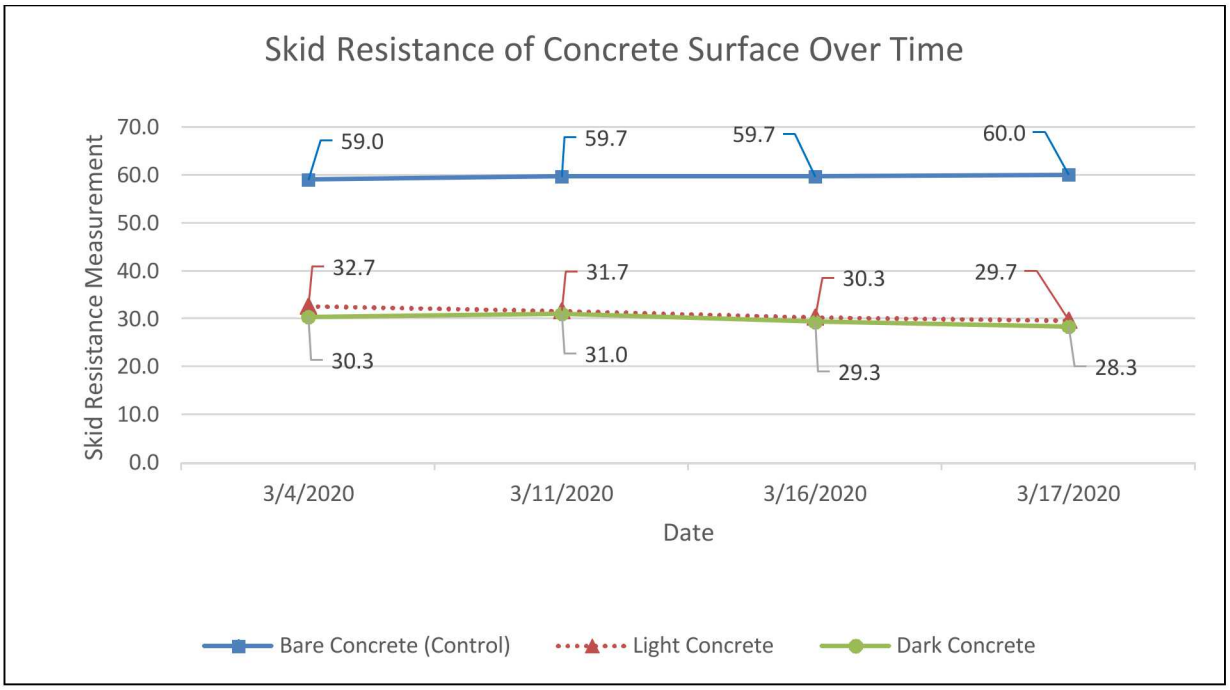

Figure 30. Skid resistance of concrete surfaces over time

In conclusion, both coatings proved to be less skid-resistant than the respective bare surfaces. It is also worth mentioning that the lowest skid-resistance numbers for both the light and the dark coatings were produced on the day after delay testing had been performed. This result indicates that the performance of the coating had a marginal increase once the test participants climbed on the barriers.

4.0 Conclusion

For delay testing, both light and dark anti-climb coatings were more effective on the passive barriers for Scenario 1 (one role player) as opposed to a passive barrier without anti-climb coating. The Scenario 1 role player's time to defeat the various versions of the DOS picket fence was slightly longer with the light version of the picket fence, ultimately taking the longest to defeat. The concrete wall was similar—the Scenario 1 role player failed to defeat the light-coated concrete wall.

The light and dark anti-climb coatings were also more effective against Scenario 2 (two role players) as opposed to a passive barrier without anti-climb coating. Although the Scenario 2 team failed all scenarios except for the bare concrete wall, their time of attempt decreased gradually. When asked why the Scenario 2 team did not take more time to try to defeat the barrier, the role players responded that the barrier was too slippery, and they knew they could not get both role players over the barrier.

The coatings did not prove to be as effective against Scenario 3 (six role players). With six role players, the Scenario 3 team was able to aid one another over the passive barriers with much less contact with the passive barrier. The Scenario 3 team was able to defeat the passive barriers faster every time they attempted the same barrier, as they had developed a process to defeat the barrier. Although the Scenario 3 team decreased their time to defeat the passive barrier with each attempt, the consensus among all six role players was that the coated barriers were more difficult to defeat than the uncoated version (see Figure 14 above).

Regarding sloughing of the coating onto role players' clothing and skin, it was found that the light coating had minimal shedding, while the dark coating seemed to shed a small amount. An experiment was conducted with a white T-shirt and the dark coating (see Section 2.3 above). The experiment demonstrated that the dark coating would stain the T-shirt, and the stain would not wash out after an initial wash.

Regarding skid-resistance testing, both light and dark coatings proved to be less skid-resistant than the respective bare surfaces. The lowest skid-resistance numbers for both light and dark coatings were produced on the day after the delay testing had been performed. This result indicates that the performance of the coating has a marginal increase once individuals climb on the barriers.

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5.0 References

[1] Martinez, R., Knight, P., and Highland, S., *Investigation into the Environmental Persistence of Coatings Intended to Render Surfaces Resistant to Climbing*, Sandia National Laboratories, SAND2014□20050 R, 2014.

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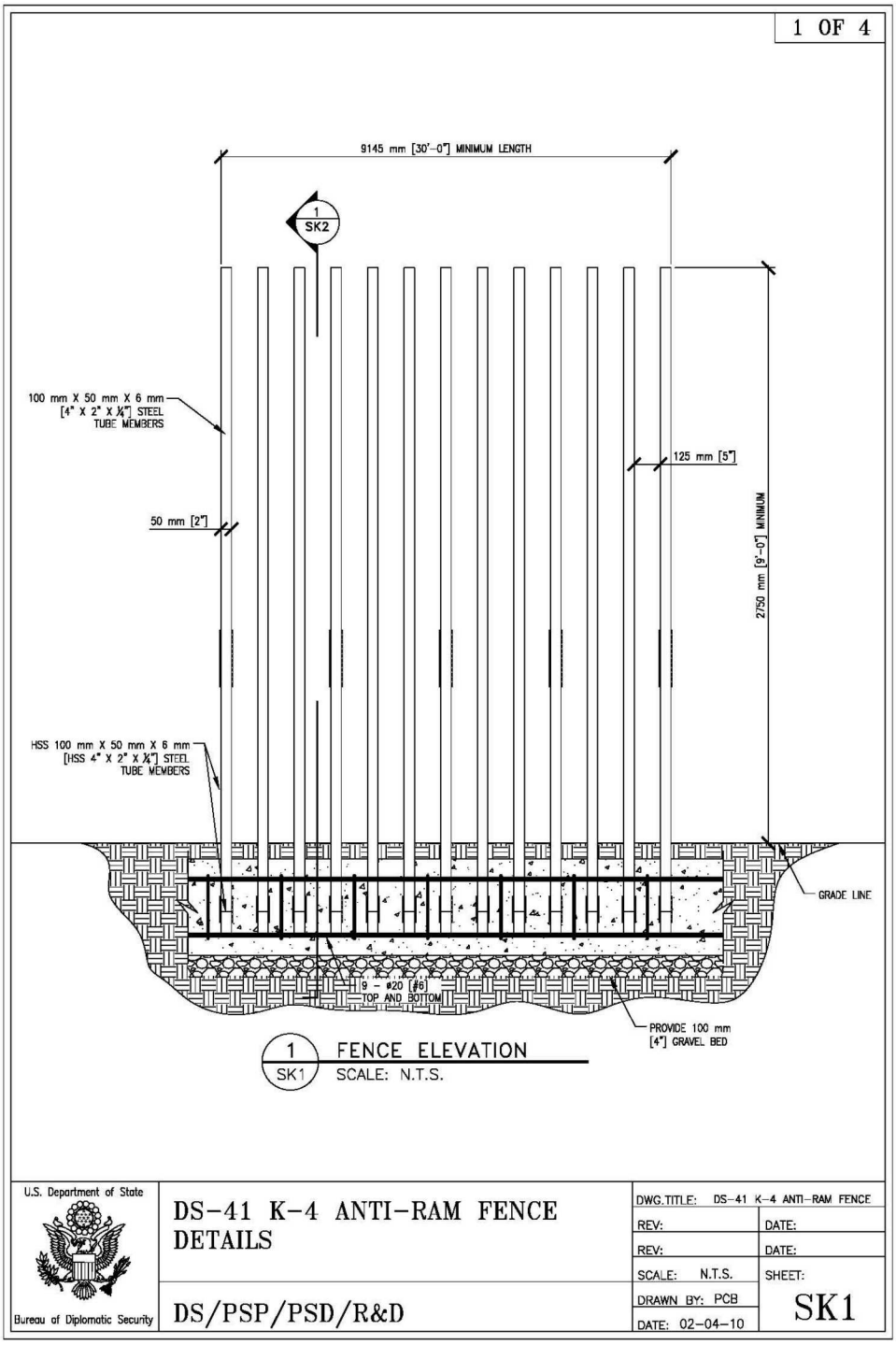
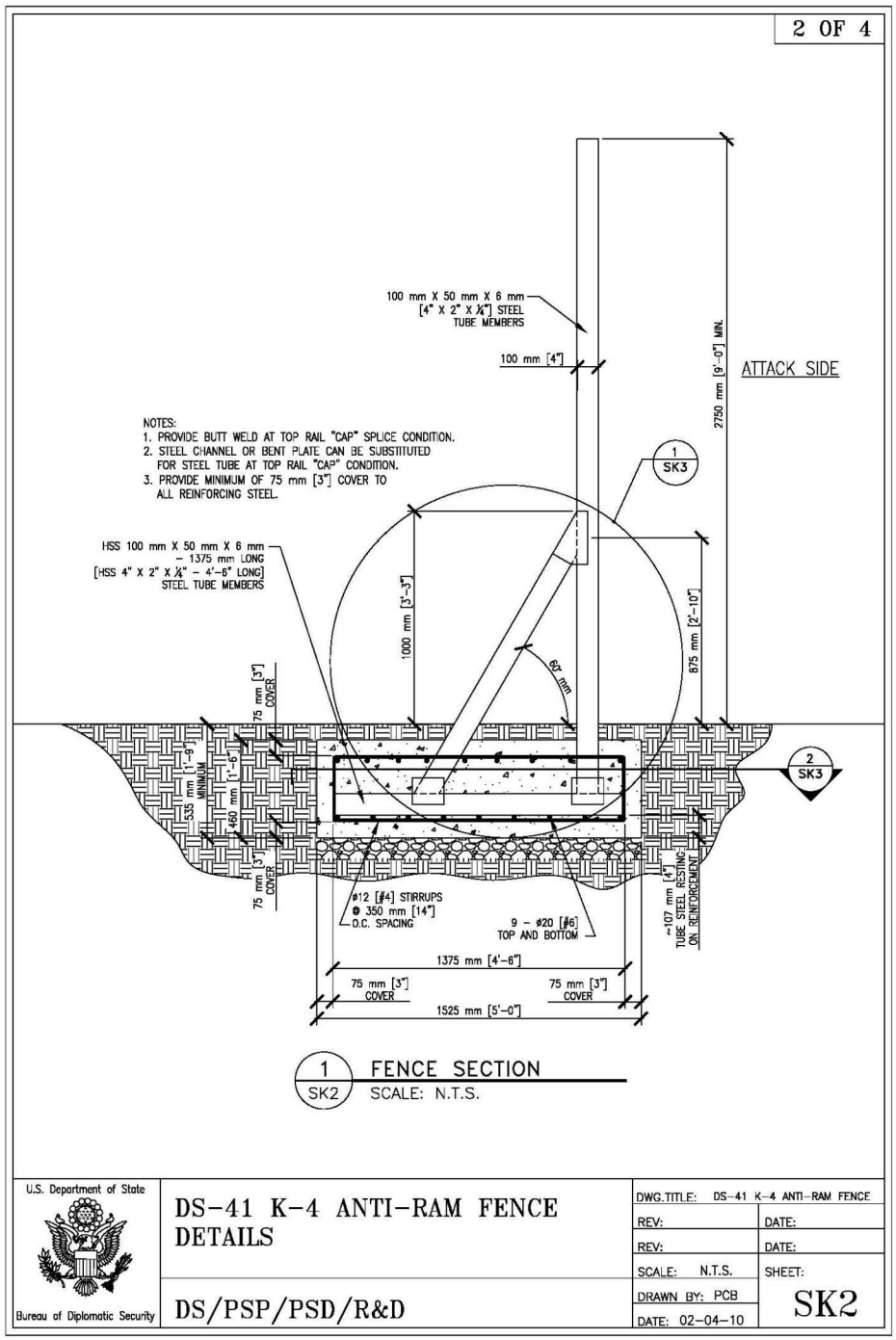
Appendix A: DS-41 K-4 Anti-Ram Fence Details

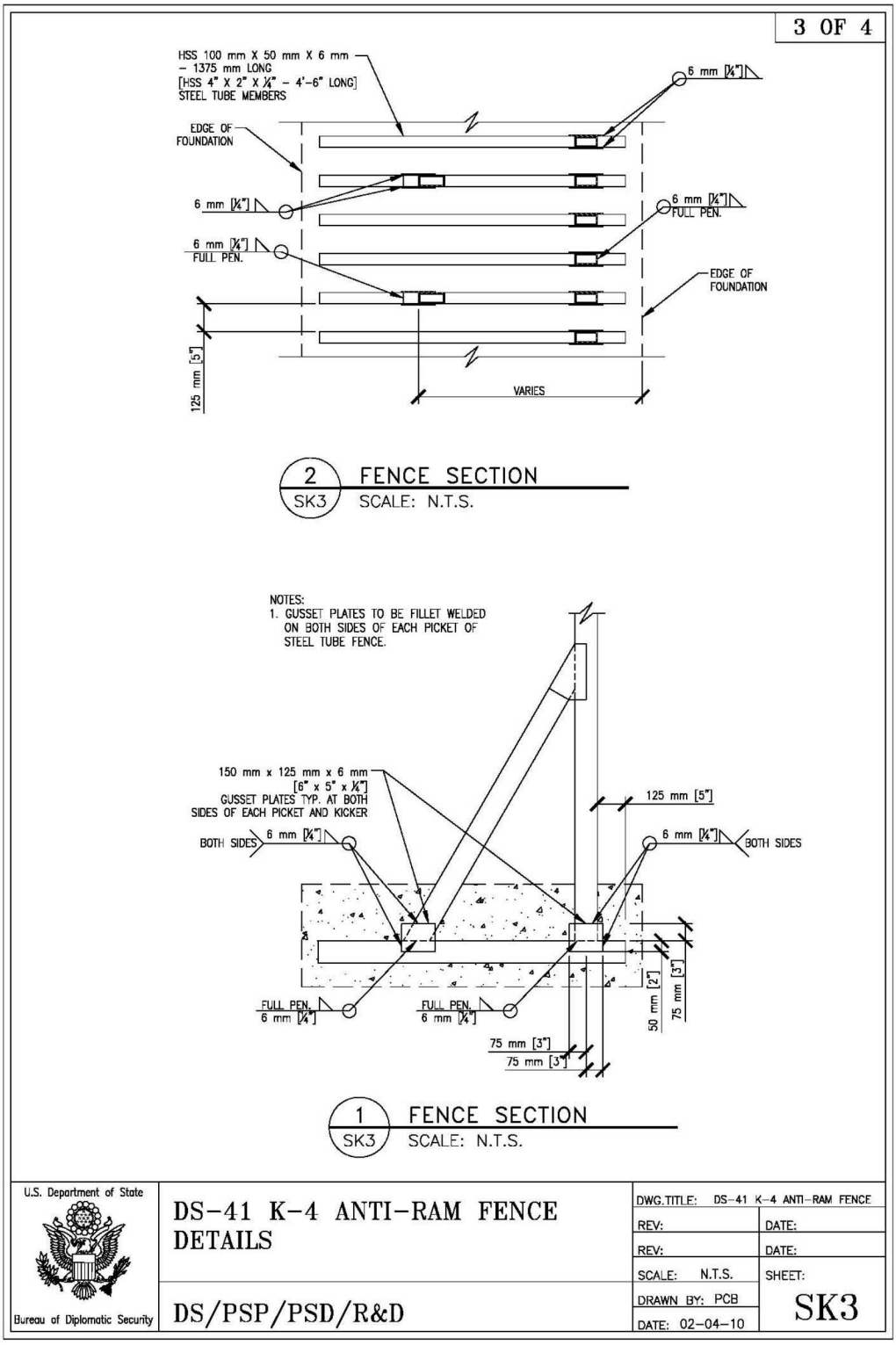
SK1



SK2


2 OF 4
100 mm X 50 mm X 6 mm
[4" X 2" X ¼"] STEEL
TUBE MEMBERS
100 mm [4"]
2750 mm [9'-0"] MIN.
ATTACK SIDE
NOTES:
1. PROVIDE BUTT WELD AT TOP RAIL "CAP" SPLICE CONDITION.
2. STEEL CHANNEL OR BENT PLATE CAN BE SUBSTITUTED FOR STEEL TUBE AT TOP RAIL "CAP" CONDITION.
3. PROVIDE MINIMUM OF 75 mm [3"] COVER TO ALL REINFORCING STEEL.
1
SK3
HSS 100 mm X 50 mm X 6 mm
– 1375 mm LONG
[HSS 4" X 2" X ¼" – 4'-6" LONG]
STEEL TUBE MEMBERS
1000 mm [3'-3"]
875 mm [2'-10"]
60°
75 mm [3"] COVER
535 mm MINIMUM [1'-9"]
460 mm [1'-6"]
75 mm [3"] COVER
2
SK3
ø12 [#4] STIRRUPS
@ 350 mm [14"]
O.C. SPACING
9 – ø20 [#6]
TOP AND BOTTOM
~107 mm [4"]
TUBE STEEL RESTING
ON REINFORCEMENT
1375 mm [4'-6"]
75 mm [3"] COVER
75 mm [3"] COVER
1525 mm [5'-0"]
1
SK2
FENCE SECTION
SCALE: N.T.S.
U.S. Department of State
Bureau of Diplomatic Security
DS–41 K–4 ANTI–RAM FENCE DETAILS
DS/PSP/PSD/R&D
DWG.TITLE: DS–41 K–4 ANTI–RAM FENCE
REV:
DATE:
REV:
DATE:
SCALE: N.T.S.
SHEET:
DRAWN BY: PCB
SK2
DATE: 02–04–10

SK3


3 OF 4
HSS 100 mm X 50 mm X 6 mm – 1375 mm LONG
[HSS 4" X 2" X ¼" – 4'-6" LONG]
STEEL TUBE MEMBERS
6 mm [¼"]
EDGE OF FOUNDATION
6 mm [¼"]
6 mm [¼"] FULL PEN.
6 mm [¼"] FULL PEN.
EDGE OF FOUNDATION
125 mm [5"]
VARIES
2 SK3 FENCE SECTION
SCALE: N.T.S.
NOTES:
1. GUSSET PLATES TO BE FILLET WELDED ON BOTH SIDES OF EACH PICKET OF STEEL TUBE FENCE.
150 mm x 125 mm x 6 mm [6" x 5" x ¼"] GUSSET PLATES TYP. AT BOTH SIDES OF EACH PICKET AND KICKER
BOTH SIDES
6 mm [¼"]
125 mm [5"]
6 mm [¼"]
BOTH SIDES
FULL PEN. 6 mm [¼"]
FULL PEN. 6 mm [¼"]
50 mm [2"]
75 mm [3"]
75 mm [3"]
75 mm [3"]
1 SK3 FENCE SECTION
SCALE: N.T.S.
U.S. Department of State
Bureau of Diplomatic Security
DS-41 K-4 ANTI-RAM FENCE DETAILS
DS/PSP/PSD/R&D
DWG.TITLE: DS-41 K-4 ANTI-RAM FENCE
REV:
DATE:
REV:
DATE:
SCALE: N.T.S.
SHEET:
DRAWN BY: PCB
SK3
DATE: 02-04-10

SK4

4 OF 4

STRUCTURAL NOTES:
STRUCTURAL STEEL:

1. ASTM A-36M (Fy= 250MPa)(36 KSI) FOR CHANNELS, PLATES AND ANGLES
   ASTM-500, GRADE B (Fy= 317 MPa)(46 KSI) FOR HOLLOW SECTIONS
   ASTM-53M, GRADE B (Fy= 240 MPa)(35 KSI) FOR PIPES

2. DESIGN, FABRICATION AND ERECTION SHALL BE IN ACCORDANCE WITH THE "AISC SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" WITH"COMMENTARY" AND THE "CODE OF THE STANDARDS PRACTICE".

WELDING:

3. WELDING SHALL CONFORM TO THE AWS CODE FOR ARC AND GAS WELDING IN BUILDING CONSTRUCTION. WELDING SHALL BE PERFORMED IN ACCORDANCE WITH A WELDING PROCEDURE SPECIFICATION (WPS) AS REQUIRED IN AWS D1.1 AND APPROVED BY THE ENGINEER, THE WPS VARIABLES SHALL BE WITHIN THE PARAMETERS ESTABLISHED BY THE FILLER-METAL MANUFACTURER. WELDS SHALL BE WADE USING E70 ELECTRODES AND SHALL BE 5MM MINIMUM UNLESS OTHERWISE NOTED. WELDING SHALL BE BY AWS CERTIFIED WELDERS.

CONCRETE:

4. CONCRETE WORK SHALL CONFORM TO CHAPTER 19 OF THE INTERNATIONAL BUILDING CODE (IBC). CONCRETE STRENGTHS SHALL BE VERIFIED BY STANDARD 28-DAY CYLINDER TESTS PER ASTM C39 AND SHALL BE AS FOLLOWS:
5. MINIMUM STRENGTH 25 MPa @ 28 DAYS
6. THE CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGNS, ALONG WITH TEST DATA COMPLIANT WITH IBC SECTION 1905, A MINIMUM OF TWO WEEKS PRIOR PLACING CONCRETE. NO WATER MAY BE ADDED TO CONCRETE IN THE FIELD UNLESS SPECIFICALLY APPROVED IN WRITING BY THE CONCRETE SUPPLIER IN CONJUNCTION WITH THE CONCRETE MIX DESIGN.
7. ALL EXPOSED CORNERS SHALL BE CHAMFERED (20mm TYP.)

REINFORCING STEEL:

8. REINFORCING STEEL SHALL CONFORM TO ASTM A-615M GRADE 420.

SOILS:

9. ALL BACKFILL SHALL BE IN COMPLIANCE WITH THE REQUIREMENTS OF SD-STD 02.01, SECTION 5.1.2. IF THE LATERALS CAPACITY OF THE EXISTING SOIL IS NOT IN CONFORMANCE WITH THE REQUIREMENTS, THEN THE EXISTING SOIL SHALL BE REPLACED WITH SOIL MEETING THOSE REQUIREMENTS.
10. THIS DESIGN DEPICTS THE PICKET FENCE INSTALLED WITH 75MM OF SOIL COVER OVER FOUNDATION. IF GREATER SOIL COVERAGE IS REQUIRED DESIGN MAY BE MODIFIED. FINAL INSTALLED DESIGN MUST MAINTAIN STEEL TUBE BRACE CONNECTION TO VERTICAL TUBE AT 1M ABOVE GRADE.

FINISHES:

11. REFER TO ARCHITECTURAL DRAWINGS AND/OR SPECIFICATIONS FOR FINISH AND CORROSION PROTECTION.

MISCELLANEOUS:

12. FENCE MAY BE PRE-FABRICATED IN SECTIONS AND TIED TOGETHER WITH STEEL MEMBERS (NOT SHOWN) OR CONSTRUCTED ON SITE FROM INDIVIDUAL PICKETS.

U.S. Department of State Bureau of Diplomatic Security	DS-41 K-4 ANTI-RAM FENCE NOTES	DWG.TITLE: DS-41 K-4 ANTI-RAM FENCE REV: DATE: REV: DATE: SCALE: N.T.S. SHEET: DRAWN BY: PCB SK4 DATE: 02-04-10
	DS/PSP/PSD/R&D	

Appendix B: JHU/APL Anti-Climb Application Procedure

JHU/APL Application Procedure

JOHNS HOPKINS
APPLIED PHYSICS LABORATORY

Anti-Climb Paint Application Procedure

1. Surface to be painted should be prepared as necessary. Surface should be clean, dry, and free of any loose debris for best adhesion.
2. Schedule outdoor painting for a time when rain is not expected for at least 48 hours.
3. Mix by hand then shake well before use as settling of product may occur.
4. Paint should be applied in a well-ventilated area. Gloves and protective eyewear are recommended. Use a drop cloth to catch drips.
5. Apply anti-climb paint with a paint brush in the vertical direction. Rolling or spraying is not recommended.
6. For smoothest coating, apply paint to cover the surface in vertical stripes (width of the paint brush) then repeat using long strokes to blend in brush marks from initial application.
7. Allow paint to dry for 48 hours.
8. Anti-climb paint must be activated to achieve minimum friction. Using moderate pressure, scuff the painted surface using a Scotch-Brite #96 pad in the vertical direction with about (5) passes over an area. The appearance of the surface will change when the surface has been activated. Use a drop cloth to catch dust.

For questions please contact Adam Maisano at adam.maisano@jhuapl.edu or 443-778-9588.

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Appendix C: Scenario Timelines

Scenario 1 Noteworthy Timelines

Anti-Climb Test Bare Steel Scenario 1:

- Time: 00:00-00:14
  - The role player inspects the barrier.
- Time: 00:14-00:23
  - The role player is unable to jump and reach the top of the barrier.
- Time: 00:23-00:35
  - The role player changes his tactic. He climbs the barrier with legs between the steel tubes and can clear the barrier.

Anti-Climb Test Dark Steel Scenario 1:

- Time: 00:00-00:007
  - The role player jumps to try to reach the top of the barrier, slips and fails.
- Time: 00:07-00:14
  - The role player pauses, wipes his hands on his pants.
- Time: 00:14-00:19
  - The role player makes another attempt at climbing the barrier but loses grip on his shoes.
- Time: 00:019-00:34
  - The role player pauses, wipes his hands on his pants a total of 4 times.
- Time: 00:34-00:47
  - The role player makes another attempt to climb the barrier but loses hand grip of the barrier while trying to reach for the top of the barrier.
- Time: 00:47-01:11
  - The role player changes his tactic. He climbs the barrier with legs between the steel tubes and can clear the barrier.

Anti-Climb Test Light Steel Scenario 1:

- Time: 00:00-00:06
  - The role player jumps to try to reach the top of the barrier, slips and fails.
- Time: 00:06-00:010
  - The role player tries again, but can't grip the barrier, too slippery.
- Time: 00:10-00:21
  - The role player pauses, wipes his hands on his pants and rubs them together.
- Time: 00:21-00:30
  - The role player makes another attempt to grab the top of the barrier, hand slips when grabbing the steel beam.

- Time: 00:30-00:34
  - The role player changes his tactic. He attempts to climb the barrier with his legs between the steel tubes. His legs slip and he is unable to reach the top of the barrier.
- Time: 00:34-00:48
  - The role player pauses, wipes his hands on his pants several times
- Time: 00:48-01:09
  - The role player tries the previous tactic again, this time his shoes slip, and he falls.
- Time: 01:09-01:28
  - The role player tries the previous tactic again, this time he can grip the barrier and can clear the barrier.

Anti-Climb Test Light Concrete Scenario 1:

- Time: 00:00-00:07
  - The role player jumps to try to reach the top of the barrier, slips and fails.
- Time: 00:07-00:17
  - The role player pauses, wipes his hands on his pants.
- Time: 00:17-00:19
  - The role player gets a running start and jumps to reach the top of the barrier, but his hand slips and he loses grip.
- Time: 00:19-00:33
  - The role player pauses, wipes his hands on his pants and rubs them together.
- Time: 00:33-00:35
  - The role player takes another running start to try to grab the top of the barrier, but his hand slips and he loses grip.
- Time: 00:35-00:48
  - The role player pauses, wipes his hands on his pants several times.
- Time: 00:48-00:50
  - The role player takes a running start and jumps to grab the top of the barrier, but he is unable to get a grip with either hand.
- Time: 00:50-01:01
  - The role player pauses, wipes his hands on his pants several times.
- Time: 01:01-01:05
  - The role player gets a running start to make another attempt, but he is unsuccessful and calls it quits.

Scenario 2 Noteworthy Timelines

Anti-Climb Test Bare Concrete Scenario 2:

- Time: 00:00 – 00:36
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.

- Time: 00:36 - 01:25
  - One role player climbs onto the other role players knee to try to extend their hand to the ledge of the concrete wall. Role players are unable to reach the ledge of the concrete wall.
- Time: 01:25 – 01:50
  - The two role players attempt the same strategy but have swapped positions. This does not work.
- Time: 01:50 – 02:04
  - Role players switch back to the original positions and are able to get one role player on top of the concrete wall.
- Time: 02:04 – 02:13
  - The role player that made it to the top of the wall adjusts to straddle the wall.
- Time: 02:13- 02:29
  - The role player straddling the wall reaches down to try to help the other role player up. The role player on the ground can't reach the other role players hand.
- Time: 02:29 – 02:50
  - The role player straddling the wall turns 180 degrees to try to reach with his opposite hand, but still can not reach the role player on the ground.
- Time: 02:50 – 03:09
  - The role player on the wall then extends their leg down for the role player on the ground to grab on to and aid in climbing the wall.
- Time: 03:09 – 03:25
  - The role player on the ground is able to climb over the wall with help from the role player straddling the wall.

Anti-Climb Test Bare Steel Scenario 2:

- Time: 00:00 – 00:37
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.
- Time: 00:37 – 01:16
  - The two role players attempt to climb the barrier by themselves. One of the role players is successful but has jumped over the safety controls and is no longer to help the other role player physically.
- Time: 01:16 – 01:38
  - The successful role player begins to instruct the other role player on how to defeat the barrier.
- Time: 01:38 – 03:00
  - The role player yet to defeat the barrier continues to try to climb the barrier with instruction from the successful role player.
- Time: 03:00 – 03:52

- The role player yet to defeat the barrier switches to a different area of the barrier hoping to have different results. The successful role player continues give instruction.

- Time: 03:52 – 04:48
  - The successful role player comes down from the safety controls and continues to instruct the other role player. The other role player is having trouble gripping the barrier.
- Time 04:48 – 04:57
  - The remaining role player wipes his hands and attempts to climb the barrier but fails.
- Time 04:57 – 05:26
  - The two role players discuss the tactics used to climb the barrier.
- Time: 05:26 – 05:48
  - The remaining role player wipes his hands and grabs hold of the steel tubes for another attempt at climbing the barrier, but quickly slides down.
- Time: 05:48 – 07:04
  - The remaining role player decided to take a break and regain composure.
- Time: 07:04 – 07:17
  - The remaining role player tries a new strategy of locking his legs/thighs around the steel tubes to gain traction, which allows him to reach and grab the top of the steel tubes.
- Time: 07:17 – 07:36
  - The remaining role player then attempts to lift himself over the barrier but is tired and lacks the strength to so. The remaining role player calls it quits.

Anti-Climb Test Dark Concrete Scenario 2:

- Time: 00:00 - 00:21
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.
- Time: 00:21 - 00:35
  - One role player attempts to climb onto the other's shoulders, but the role player on top is to able to grip the wall and the role player on the bottom is unable to find balance.
- Time: 00:35 – 01:33
  - Role player pause to talk strategy and inspect the barrier.
- Time: 01:33 – 01:45
  - The role players have changed their strategy and are now trying use the knee of one of one role player to help the other up, but they are unable to grab hold of the barrier ledge.
- Time: 01:45 – 02:11
  - Role player pause to talk strategy and inspect the barrier again.
- Time: 02:11 – 02:30

- The role players try their first approach again of climbing onto one another's shoulders. Due to lack of grip the role players slip but are able to adjust and get one of the role players on top of the wall.

- Time: 02:30 – 02:48
  - The role player on top of the wall adjusts to straddle the wall.
- Time: 02:48 – 03:07
  - The role player straddling the wall extends his leg down for the other role player to grab onto. Both role players are not able to get grip onto the barrier and this tactic fails.
- Time: 03:07 – 03:51
  - Both role players take a break and begin to discuss strategy.
- Time: 03:51 – 04:02
  - The role player straddling the wall changes position to gain leverage when the other role player grabs his leg to aid the climb. Still no grip and this tactic fails.
- Time: 04:02 – 04:34
  - Both role players take a break and begin to discuss strategy.
- Time: 04:34 – 05:42
  - The role players attempt the same strategy again. As one role player is climbing up the others leg, he grabs the top of the wall but cannot maintain grip.
- Time: 05:42 – 06:04
  - The role players try the leg climbing strategy again but fail.
- Time: 06:04 – 06:57
  - Both role players take a break.
- Time: 06:57 – 08:50
  - The role players attempt the same strategy again. As one role player is climbing up the others leg, he grabs the top of the wall but cannot maintain grip. The role player straddling the wall states that he is unable to hold on to the barrier and support the others weight without falling off. He cites unable to grip the wall.
- Time: 08:50 – 09:24
  - The role players try again and fail. The role player straddling the wall state that grip of the wall is a huge concern.
- Time: 09:24 – 10:33
  - The role players make two more attempts using the same technique but fail, and call it quits.

Anti-Climb Test Dark Steel Scenario 2:

- Time: 00:00 - 00:37
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.
- Time: 00:37 – 00:43

- One role player attempts to climb the barrier by himself but quickly slides do to lack of grip of the barrier.

- Time 00:43 – 01:19
  - One role player begins to climb on top of the others knee while the other help to prop him up. The role players are unable to reach the top of the barrier and fall.
- Time: 01:19 – 01:38
  - The role players discuss a new strategy and inspect the barrier again.
- Time: 01:38 – 01:46
  - One of the role players begins to climb the barrier without help from the other but is unable to maintain grip of the barrier and fails.
- Time: 01:46 – 03:05
  - Both role players take a break and begin to discuss strategy.
- Time: 03:05 – 03:14
  - One role player makes another attempt at climbing the barrier without help but fails due to lack of grip.
- Time: 03:14 – 04:23
  - One role player climbs onto the others shoulders and reaches for the top of the barrier. The role player on top is unable to gain enough leverage to pull himself over the barrier.
- Time: 04:23 – 05:08
  - The role players switch positions and use the same knee technique. This time one role player is able to grab hold of the barrier and pull himself over.
- Time: 05:08 – 05:20
  - The remaining role player tries to climb the barrier by wrapping his legs around the steel tubes but is already exhausted and calls it quits.

Anti-Climb Test Light Concrete Scenario 2:

- Time: 00:00 – 00:25
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.
- Time: 00:25 – 01:02
  - One role player climbs onto the other shoulders, but both role players are already fatigued and stumble. They try two times but are not successful.
- Time: 01:02 – 01:41
  - The role players switch to a knee and boost approach but there is no success, they are unable to reach the top of the wall.
- Time: 01:41 – 03:35
  - The role players revert back to the shoulder technique, but the role player on the bottom is unable to hold the weight of the other. This is followed by a break and inspection of the barrier.

- Time: 03:35 – 03:55
  - The role players make another attempt at the shoulder technique and are able to get one of them on top of the wall.
- Time: 03:55 – 04:12
  - The role player on top of the wall adjusts to straddle the wall.
- Time: 04:12 – 04:47
  - The role player straddling the wall extends his leg down for the other grab hold of. This tactic fails due to lack of grip from both role players.
- Time: 04:47 – 05:53
  - The role players take a break to strategize. One role player wipes of the bottom of their shoes.
- Time 05:53 – 06:13
  - Another attempt is made using the technique of an extended leg from the role player straddling the wall. Lack of grip and fatigue have clearly set in and the role players call it quits.

Anti-Climb Test Light Steel Scenario 2:

- Time: 00:00 - 00:20
  - Role players begin to inspect the barrier and discuss a strategy of how they are going to defeat the barrier.
- Time: 00:20 – 00:40
  - One role player climbs onto the other shoulders in an attempt to reach the top of the barrier. One role player reaches the top of the barrier but is unable to pull him self over due to fatigue.
- Time: 00:40 – 01:23
  - Both role players take a break and begin to discuss strategy.
- Time: 01:23 – 01:56
  - The role players make another attempt at the shoulder technique. This time the role player on top has enough strength to reach the top of the steel beam and pull himself over.
- Time: 01:56 – 02:01
  - One of the role players has cleared the barrier, but can no longer help the other
- Time: 02:01 – 02:41
  - The remaining role player takes a break and begins to strategize.
- Time: 02:41 – 04:15
  - The remaining role players tries multiple times to climb the barrier but lacks enough grip to reach the top of the steel tubes. He calls it quits.

Appendix D: Role Player Surveys

Bare Concrete

Department of State Barrier Project: Questionnaire

Role Player Identifier	R1-1
Scenario Number	1 - Concrete

1. What was difficult about climbing this barrier?

- Height
- Must be able to reach top (jump) if you do it alone
- Strength to pull yourself up

2. What was easy about climbing this barrier?

- Flat surface on top
- Thin wall so I could reach the other side easily.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Jumped & pulled myself up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Concrete provides no way to use your feet to help you.

6. Describe your experience in this scenario:

Once I reached the top & held on, I knew I could pull myself up.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-1
Scenario Number	1- concrete

1. What was difficult about climbing this barrier?

You couldn't grip onto the concrete with your feet or hands unless you could somehow reach the top.

2. What was easy about climbing this barrier?

Having a partner made climbing the barrier a lot easier because you were able to strategize & get help.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Yes, I was helped to the top of the barrier & sat on the edge & helped my partner get up. I think this was the easiest approach.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	(3)	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, the concrete brought a new challenge of making it to the top.

6. Describe your experience in this scenario:

I was helped up to the top & sat on the ledge. I then let my partner grab my leg & climb up.

Department of State Barrier Project: Questionnaire

Role Player Identifier	RP-2
Scenario Number	1 concrete

1. What was difficult about climbing this barrier?

Not having anywhere to grip for your hands or where to put your feet.

2. What was easy about climbing this barrier?

It was a lot easier to have a partner

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Just to get one person up first + then help the other

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	(3)	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes the ability to pull yourself over

6. Describe your experience in this scenario:

My experience was that it was challenging + required thought

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3 - 1
Scenario Number	1 Concrete

1. What was difficult about climbing this barrier?

All flat = nowhere to grab / put feet

2. What was easy about climbing this barrier?

Flat wall, easy to sit on top and help others up

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

climb the wall by getting on someone's back, have someone stay up top to help others

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

No place to put your feet

6. Describe your experience in this scenario:

easier compared to the steel bars

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-2
Scenario Number	1-Concrete

1. What was difficult about climbing this barrier?
   Nothing to grab onto till the top.
2. What was easy about climbing this barrier?
   Once to the top easier to grasp
3. Was there a specific technique you used to climb the barrier? Why did you use this technique?
   Using team work to lift each other over.
4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	(Easy)	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?
   No Grip till the top
6. Describe your experience in this scenario:
   Easier than the metal with more people

Department of State Barrier Project: Questionnaire

Role Player Identifier	B3-3
Scenario Number	1 Concrete

1. What was difficult about climbing this barrier?

Nothing

2. What was easy about climbing this barrier?

Structure was just thick enough for hands to create levarage

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Leverage and Muscle.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

No

6. Describe your experience in this scenario:

It was great.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-4
Scenario Number	1- Concrete

1. What was difficult about climbing this barrier?

The smooth flat surface was slick & didn't provide any traction.

2. What was easy about climbing this barrier?

Having teammates to help get up & over.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Had climbed onto a teammates back then had others help hoist the rest of the way up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	(Moderate)	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, the concrete barrier was a bit more difficult because of the type of surface.

6. Describe your experience in this scenario:

The barrier didn't provide any traction nor opportunities to leverage ourselves up.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-5
Scenario Number	Scenario 1 Concrete

1. What was difficult about climbing this barrier?

   Sheer surface.

2. What was easy about climbing this barrier?

   could get a running start.
   very comfortable at the top.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   Team - worked people up & they helped pull people over - otherwise running & jumping would work.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   No

6. Describe your experience in this scenario:

   Went smoothly with a team.

Department of State Barrier Project: Questionnaire

Role Player Identifier	RP-6
Scenario Number	1 Concrete

1. What was difficult about climbing this barrier?

Smooth surface harder to climb up

2. What was easy about climbing this barrier?

Team work x2 personnel assisting people over
2 guy left behind.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

One guy WAS a step on the ground
x2 people were on top of wall assisting everyone over.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

N/A

6. Describe your experience in this scenario:

every one climbed on me, once the 2x people had the climber I would grab there feet and assist them over.

Bare Steel

Department of State Barrier Project: Questionnaire

Role Player Identifier	R1-1
Scenario Number	1 - Steel

1. What was difficult about climbing this barrier?

Height
Slippery (maybe the paint?)

2. What was easy about climbing this barrier?

Flat edge of steel beam on top made it easy to climb up once you reached it.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

I clamped my feet around the beam & used that to lunge upward toward the top of the steel beam

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Somewhat, not really used to climbing up poles.

6. Describe your experience in this scenario:

Once I was able to determine the flat edge of the beam, it was simple for the most part. overall it was challenging

Department of State Barrier Project: Questionnaire

Role Player Identifier RP2-1	
Scenario Number 1: Steel	

1. What was difficult about climbing this barrier?

The barrier was slippery and hard to get grip of. Also if you were doing it by yourself you needed a lot of upper-body strength.

2. What was easy about climbing this barrier?

There was supports on the back where you can rest your feet. Also it was easy to squeeze your legs in the spaces for grip.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

I tried to pull myself up and thought that would be the best way to defeat the barrier.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	(3)	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, there could be a challenge if someone were to climb the barrier without helping others first.

6. Describe your experience in this scenario:

I think that eventually I found a way to climb up the barrier but used all my energy so by the time I made it up, it was too hard to pull myself up and over.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-2
Scenario Number	Steel

1. What was difficult about climbing this barrier?

   Nothing was to difficult. If anything the Steel being slippery

2. What was easy about climbing this barrier?

   That it wasn't tall.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   To use the support Bar to rest + then Pull myself over

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

(1) Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

   It provided the challenge of knowing how to help someone else get over.

6. Describe your experience in this scenario:

   This Scenario was a good experience but there are definitely some things I could have improved on. (such as helping my partner)

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-1
Scenario Number	1 steel

1. What was difficult about climbing this barrier?

The width was large enough to put your foot through, but small enough to get it stuck (as opposed to using it as a foot-stop to push yourself up)

2. What was easy about climbing this barrier?

Having multiple adversaries to assist

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Use one person on all fours, another person steps up onto their back and grabs the top, hoists themselves up, person on ground gets up and helps push person up & over. Allowed us to gain height and place people at the top of the fence

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

supporting yourself as well as helping others up

6. Describe your experience in this scenario:

Challenging if you're the weakest link; easier if you have a good strategy coming into it

Department of State Barrier Project: Questionnaire

Role Player Identifier	RS-2
Scenario Number	1

1. What was difficult about climbing this barrier?

   It's tall I'm short

2. What was easy about climbing this barrier?

   Using team work

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   Using others to lift you to the top of the barrier

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   The challenge was to think up a strategy

6. Describe your experience in this scenario:

   Fairly straight forward, would have been harder with less people.

Department of State Barrier Project: Questionnaire

Role Player Identifier R3-3	
Scenario Number Steel	

1. What was difficult about climbing this barrier?

Slippery

2. What was easy about climbing this barrier?

Well structured so made easy to leverage.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

No technique.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

no

6. Describe your experience in this scenario:

great!

Department of State Barrier Project: Questionnaire

Role Player Identifier R3-4	R3-4
Scenario Number 1- Steel	1-Steel

1. What was difficult about climbing this barrier?

The steel square tubing was tall and the smooth surface made it difficult to climb alone.

2. What was easy about climbing this barrier?

When I had help from my teammate by standing on his shoulders it was easier to hoist myself up over the barrier.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Yes, using our teammates (climb on their shoulders) & hoist ourselves over. The last person then climbed up until the team could reach down & assist him the rest of the way

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

If I were alone, this would have been more challenging.

6. Describe your experience in this scenario:

My experience in this was somewhat easy with the help of my teammates. I was the first person over the barrier in a short amount of time. If I were by myself, this would have been much more difficult.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-S
Scenario Number	Scenario 1 Steel

1. What was difficult about climbing this barrier?

   No foot leverage / parallel bars

2. What was easy about climbing this barrier?

   small enough to grip the back side, not too slippery & the grip was pretty good.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   because the bars were small I could place my foot on the bar & reach around creating purchase and climbing up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	(Moderate)	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   yes a running start seemed relatively useless

6. Describe your experience in this scenario:

   with help the whole group made it over relatively smoothly. Depending on technique it was still fairly simple

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-6
Scenario Number	Steel

1. What was difficult about climbing this barrier?

   Nothing, Teamwork was able to get everyone over the barrier.

2. What was easy about climbing this barrier?

   Working together as a team

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   I assisted 2 personel up then they helped me up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	(Easy)	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   N/A

6. Describe your experience in this scenario:

   I was the step everyone used to step up. When the personnel were climbing I would grab there feet and push them up.

Dark Concrete

Department of State Barrier Project: Questionnaire

Role Player Identifier	RT-1
Scenario Number	1 – Dark Conc.

1. What was difficult about climbing this barrier?

Wall seemed slicker with the paint

2. What was easy about climbing this barrier?

I was able to jump up & grab the top & pull myself up

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Jump & grab

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

No

6. Describe your experience in this scenario:

- Wall seemed more slick
- Wall seemed tall

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-1
Scenario Number	3-Dark Concrete

1. What was difficult about climbing this barrier?

The coating over the concrete was a lot harder to grip. Even while sitting on top of the wall, you slip a lot easier

2. What was easy about climbing this barrier?

The thickness of the concrete wall made it easy to pull yourself up & over.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

I climbed on my partners shoulders & hopped on the concrete wall. I then stuck out my leg for my partner to grab onto & use to climb.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, the coating made everything a lot more difficult since there was barely any grip.

6. Describe your experience in this scenario:

I think that the coating made the wall look a lot taller. Also while sticking my leg out for my partner to use was a lot more difficult as it pulled me down & I couldn't grip the wall with my legs.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R 2 -2
Scenario Number	3 Dam Concrete

1. What was difficult about climbing this barrier?

How slippery it was & how your feet would not stick.

2. What was easy about climbing this barrier?

Nothing.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

we used the method of one person standing on the other persons shoulder.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

factoring in no grip

6. Describe your experience in this scenario:

The more someone climbed that area the more polished it became making it more slippery

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3 - 1
Scenario Number	3 - Dark concrete

1. What was difficult about climbing this barrier?

   Slick, flat wall, much less grip

2. What was easy about climbing this barrier?

   Nothing seemed easier compared to previous run

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   Same technique, body & shoulders

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   A bit harder due to slick surface

6. Describe your experience in this scenario:

   Wall felt a lot slicker compared to the control, couldn't gain much traction

Department of State Barrier Project: Questionnaire

Role Player Identifier	SS-2
Scenario Number	3- Dark Concrete

1. What was difficult about climbing this barrier?

the height

2. What was easy about climbing this barrier?

Team Work

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Pull each other Up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Just a bit more slick

6. Describe your experience in this scenario:

From the previous test the wall was a bit more slick, not enough to make a difference

Department of State Barrier Project: Questionnaire

Role Player Identifier	RP3.3
Scenario Number	3- Dark Corridor

1. What was difficult about climbing this barrier?

NONE

2. What was easy about climbing this barrier?

Same for all one piece solid surfaces

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Team work ladder

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

NO

6. Describe your experience in this scenario:

little slippery.

Department of State Barrier Project: Questionnaire

Role Player Identifier	E3-4
Scenario Number	3 Dark Concrete

1. What was difficult about climbing this barrier?

The surface was more slick.

2. What was easy about climbing this barrier?

Having the help from our team to get up & over.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

The same technique we've been using as a six-person team

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

The surface being more slippery created a new challenge.

6. Describe your experience in this scenario:

This scenario was different because the coating/surface of the concrete was more slippery than the first round on concrete

Department of State Barrier Project: Questionnaire

Role Player Identifier	
Scenario Number	3 dark concrete

1. What was difficult about climbing this barrier?

   Slippery

2. What was easy about climbing this barrier?

   Team made it easy.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   Teams Tower with people lifting once on the wall

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   The slippery wall was more difficult for the first & last people.

6. Describe your experience in this scenario:

   The first people had to deal with the more slick wall & the last person had to be lifted entirely.

Department of State Barrier Project: Questionnaire

Role Player Identifier	RS-6
Scenario Number	3-Dark Concrete

1. What was difficult about climbing this barrier?

Wall ~~was~~ has a slipping surface. Was harder to get a grip.

2. What was easy about climbing this barrier?

It took Teamwork To get everyone over.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Everyone stepped on my back, Brian Assisted getting over the wall by having people stand on his shoulders then 2 personal were on top and Assisted.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	(4) Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

Slippery surface. The team had to work together to get over.

6. Describe your experience in this scenario:

It was difficult for me to get over. Being the last person ~~No one could~~ I had no one to give me a boost so the 2 people at the top was all I had to get over. Due to the slick wall my shoes were unable to ~~get~~ grip so it was more work for Diego & Brandon to get me over.

Dark Steel

Department of State Barrier Project: Questionnaire

Role Player Identifier	R1-1
Scenario Number	3 - Dark steel

1. What was difficult about climbing this barrier?

Height (taller?)
Steel was more slick

2. What was easy about climbing this barrier?

As a single doing this:
- Use the area between the bars to slide your leg in to climb up

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Used my legs & knees to grapple the bars (used area between bars to slide legs in)

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

- Steel seemed more slick

6. Describe your experience in this scenario:

- Steel seemed more slick
- Barrier seemed taller
- Took longer to defeat

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-1
Scenario Number	3- Steel

1. What was difficult about climbing this barrier?

The barrier was a lot more smooth and didn't allow any grip whether it be shoes, hands, and hugging your knees in the gaps.

2. What was easy about climbing this barrier?

You could climb on someones shoulders to get up and around but doing it by yourself would be really difficult.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

I tried hugging my legs around the steel but could not get any grip. I Also tried using my feet to grip but was unable to. It was also difficult to grip on the top of the steel & pull myself up. We then went on each other's shoulders & only one made it up & over.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	(4)	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, there was a big challenge to find grip or a way to pull yourself up.

6. Describe your experience in this scenario:

I noticed that there was some kind of coating on the steel. It was a lot more slippery & I was unable to get grip at all. I then went on my partner's shoulders but even at the top of steel it was hard to get any grip.

Department of State Barrier Project: Questionnaire

Role Player Identifier	2 – 2
Scenario Number	3 steel

1. What was difficult about climbing this barrier?

How slippery the steel was

2. What was easy about climbing this barrier?

That you could ~~still~~ grip the steel. @ the top

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Yes, we used a two man lift system.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Yes, the grip factor.

6. Describe your experience in this scenario:

It was very slippery for the shoes I was wearing.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-1
Scenario Number	3 Dark steel

1. What was difficult about climbing this barrier?

Slicker, but marginally tougher

2. What was easy about climbing this barrier?

less Friction between bars = improved grip

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Same technique as before, except an additional person was used to step on their shoulders for more weight

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

3.5

5. Did this scenario provide any new challenges?

Easier to slip

6. Describe your experience in this scenario:

A bit tougher, but we used the same technique and still made it over

Department of State Barrier Project: Questionnaire

Role Player Identifier	RS-2
Scenario Number	3- Dark Steel

1. What was difficult about climbing this barrier?

   About the same as the bare version

2. What was easy about climbing this barrier?

   Team work

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   Use others to lift you up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   No.

6. Describe your experience in this scenario:

   Just as easy as bare version

Department of State Barrier Project: Questionnaire

Role Player Identifier	2 of 3
Scenario Number	3 Steel

1. What was difficult about climbing this barrier?

Felt a little different. Slip wise?

2. What was easy about climbing this barrier?

It was the same as the last
felt a little taller?

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Team work used each other as leverage.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

NO

6. Describe your experience in this scenario:

Went well. seemed a little taller?

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-4
Scenario Number	3 - Steel

1. What was difficult about climbing this barrier?

   It felt a bit taller than the ~~last~~ first scenario.

2. What was easy about climbing this barrier?

   Having the help from our team.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   The technique we used was to climb our teammates and then have them help to hoist us over the barrier

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   The idea that it felt taller than the first steel climb provided a bit more difficulty.

6. Describe your experience in this scenario:

   We continue to use the same technique of utilizing our teammates to climb the barrier.

Department of State Barrier Project: Questionnaire

Role Player Identifier	
Scenario Number	Scenario 3 Dark Steel

1. What was difficult about climbing this barrier?

A small bit harder due to the coating however in a team easily overcome.

2. What was easy about climbing this barrier?

Top handholds

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Team lifting starting with base a taller step & up & over. Then two people on top to pull people up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

The coating was harder to get purchase on.

6. Describe your experience in this scenario:

With a good team & an idea of how to lift others it can still be overcome smoothly.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-6
Scenario Number	3- Steel

1. What was difficult about climbing this barrier?

Seemed taller, slippery

2. What was easy about climbing this barrier?

Teamwork was used to get everyone over

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Teamwork was used to get everyone over

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

3 layers of teamwork.
- people climbed on my back
- Brian assisted
- Diego/ R3-2 assisted getting personnel over.

6. Describe your experience in this scenario:

Everyone climbed on my back. I'm the last guy to get over.

Light Concrete

Department of State Barrier Project: Questionnaire

Role Player Identifier	R1-1
Scenario Number	1 - light Concrete

1. What was difficult about climbing this barrier?

- Extremely slippery
- Tall
- Beveled Conc. Edge

2. What was easy about climbing this barrier?

Nothing

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Jump & grab top of wall

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

6. Describe your experience in this scenario:

- Very slippery
- Very tall
- Can't grip!!!

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-1
Scenario Number	2-Light Concrete

1. What was difficult about climbing this barrier?

The barrier was very slippery

2. What was easy about climbing this barrier?

Having a partner to help me up.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Yes, I climbed on my partner's shoulder & once I made it up I tried to help him up. This was the easiest ~~technique~~ technique to do

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	(Very Difficult)

5. Did this scenario provide any new challenges?

Yes, the coating was the most slick ~~out of the~~ compared to the dark coating.

6. Describe your experience in this scenario:

I had a really hard ~~the~~ time gripping the wall. Once I was up I tried extending my leg out but I kept slipping due to the coating.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-2
Scenario Number	Scenario 2 light concrete

1. What was difficult about climbing this barrier?

How slippery it was.

2. What was easy about climbing this barrier?

Nothing.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

We used the shoulder technique

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Slippery

6. Describe your experience in this scenario:

We got one person up but was to slippery to get the second person.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-1
Scenario Number	3 light concrete

1. What was difficult about climbing this barrier?

Smooth + Flat

2. What was easy about climbing this barrier?

Teamwork!

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Same strategy

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

Nowhere to Put Your Feet

6. Describe your experience in this scenario:

Similar to previous tests; strategy seems to nearly negate the obstacle

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-2
Scenario Number	3- Light Concrete

1. What was difficult about climbing this barrier?

The concrete coated is the slickest yet.

2. What was easy about climbing this barrier?

Team work

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Use others to lift another over.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

The slick wall made it hard to get the last person over

6. Describe your experience in this scenario:

The last coating made a difference on grip strength

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-3
Scenario Number	3 Right Concrete

1. What was difficult about climbing this barrier?

Slick

2. What was easy about climbing this barrier?

Nothing slick

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Leverage, ladder, team work

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

No

6. Describe your experience in this scenario:

Slick

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-4
Scenario Number	3-Light Concrete

1. What was difficult about climbing this barrier?

   This barrier was significantly more slick than the other concrete coatings.

2. What was easy about climbing this barrier?

   Having the help from my team

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   We maintained the technique of utilizing our team members to climb & hoist each other up & over

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	(Easy)	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

   Yes. The coating was much more slick.

6. Describe your experience in this scenario:

   This scenario proved to be more slick, but our team was more comfortable & confident with our technique & were able to get everyone over.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3 - 5
Scenario Number	2 light concrete

1. What was difficult about climbing this barrier?

Super slick uniform surface.

2. What was easy about climbing this barrier?

using a team.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Team boost up & lift.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

yes very slippery & uniform.

6. Describe your experience in this scenario:

~~xx~~ ~~exit~~ I would not accomplish it without a team. The surface is too slippery to get any purchase.

Department of State Barrier Project: Questionnaire

Role Player Identifier R3-b	
Scenario Number 3 Light Concrete	

1. What was difficult about climbing this barrier?

Wall was slick.

2. What was easy about climbing this barrier?

Nothing.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Took Teamwork to get over. Same practice in previous exercises was used.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Same as other slick scenarios.

6. Describe your experience in this scenario:

Same as other scenarios.

Light Steel

Department of State Barrier Project: Questionnaire

Role Player Identifier	R1-1
Scenario Number	1 - Light Steel

1. What was difficult about climbing this barrier?

   Very slippery steel

2. What was easy about climbing this barrier?

   Was able to fit legs in between steel beams & work my way up

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

   See above, once I had a good grip I could pull myself up

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

   Slippery

6. Describe your experience in this scenario:

   - Seemed more slick (new material)

Department of State Barrier Project: Questionnaire

Role Player Identifier	R2-1
Scenario Number	2 B - Light steel

1. What was difficult about climbing this barrier?

The coating on the steel was a lot more slick than the dark coating. This made it hard to try & climb up the posts.

2. What was easy about climbing this barrier?

Going on my partner's shoulders made it easy to go up & over.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

My partner allowed me to get on his shoulders & I pulled myself up & over the wall.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

Yes, the coating made climbing & grip a lot harder to grip anything to use upper-body strength to climb up.

6. Describe your experience in this scenario:

I climbed on my partner's shoulders & pulled myself up & over. My partner then tried to climb up the steel by himself but was unable to.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R 2 ~ L
Scenario Number	Light Steel

1. What was difficult about climbing this barrier?

How slippery the surface was.

2. What was easy about climbing this barrier?

Nothing.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

We ha we put one person on eachothers shoulders

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

No, just slippery.

6. Describe your experience in this scenario:

In this scenario, it was very slippery it did not allow my shoes to grip.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-1
Scenario Number	2 Light Steel

1. What was difficult about climbing this barrier?

very, very smooth surface

2. What was easy about climbing this barrier?

Nothing seems apparently easier

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Same technique, stepping on someone's back. This method seems most effective to resist the changes in each test's surface friction

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Transition between going from on someone's back to being hoisted up is tougher, since the transition between them requires the adversary to hold himself in the air momentarily, without any grip

6. Describe your experience in this scenario:

very slick surface, but using the same strategy seems to have mitigated the increased difficulty of the smooth surface. By far the toughest steel wall test of the three

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-2
Scenario Number	3- Light Steel

1. What was difficult about climbing this barrier?

The metal was pretty slick and harder to get a grip

2. What was easy about climbing this barrier?

Using team work is ideal

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Use multiple people to assist with getting over

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

The new surface was pretty slick

6. Describe your experience in this scenario:

This version was a bit harder to get over as grip was decreased

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-3
Scenario Number	2-#8 light Steel

1. What was difficult about climbing this barrier?

Slick.

2. What was easy about climbing this barrier?

Nothing the separate bars make difficult to climb.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Ladder and Team work leverage.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	3	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Slick paint

6. Describe your experience in this scenario:

Slick

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-4
Scenario Number	2 3 - Light Steel

1. What was difficult about climbing this barrier?

This barrier was much more slipping that the others which made it more difficult.

2. What was easy about climbing this barrier?

Having our teammates help climb + hoist the others up

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

We have used the same technique which has been pretty successful. One person climbs onto another + climbs to the top, that person helps others climb up + over.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

The surface material made this scenario a bit more challenging.

6. Describe your experience in this scenario:

This scenario was a bit more difficult especially for the first and last person on our team.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-5
Scenario Number	2 light ~~alum~~ steel

1. What was difficult about climbing this barrier?

Very very slippery

2. What was easy about climbing this barrier?

Doing it in a team

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

Team boost up & lift up.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1 Very Easy	2 Easy	3 Moderate	4 Difficult	5 Very Difficult

5. Did this scenario provide any new challenges?

Yes the element was much much more slippery.

6. Describe your experience in this scenario:

would be very difficult without a team. The barrier was much more slippery.

Department of State Barrier Project: Questionnaire

Role Player Identifier	R3-6
Scenario Number	3 LIGHT STEEL

1. What was difficult about climbing this barrier?

SLIPPERY SURFACE

2. What was easy about climbing this barrier?

IT TOOK TEAM WORK TO GET EVERYONE UP.

3. Was there a specific technique you used to climb the barrier? Why did you use this technique?

I was the step everyone used to stand up on to gain height.

4. On a scale of 1 to 5 how difficult was it to climb this barrier?

1	2	(3)	4	5
Very Easy	Easy	Moderate	Difficult	Very Difficult

5. Did this scenario provide any new challenges?

Same scenarios As the black slippery surface.
Unable to get a good grip with my hands or shoes.

6. Describe your experience in this scenario:

I was the last person over the wall, it took 2 people on top to assist me over.

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