



**SOLID**Proof  
*Bring trust into your projects*

**Blockchain Security | Smart Contract Audits | KYC**

MADE IN GERMANY

# Audit

**Security Assessment**  
**20. December, 2021**

**For**



**BULLIEVERSE**

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# Disclaimer

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Version	Date	Description
1.0	20. December 2021	<ul style="list-style-type: none"><li>• Layout project</li><li>• Automated- /Manual-Security Testing</li><li>• Summary</li></ul>

## **Network**

Binance Smart Chain (BEP20)

## **Website**

<https://bullieverse.com/>

## **Telegram**

<https://t.me/Bullieverse>

## **Twitter**

<https://twitter.com/Bullieverse>

## **Discord**

<https://discord.com/invite/bullieverse>



## Description

A fantasy Metaverse Island where you can play games, create experiences and earn rewards

## Project Engagement

During the 15th of December 2021, **Bullieverse Team** engaged Solidproof.io to audit smart contracts that they created. The engagement was technical in nature and focused on identifying security flaws in the design and implementation of the contracts. They provided Solidproof.io with access to their code repository and whitepaper.

## Logo



## Contract Link

**v1.0**

• TBA

# Vulnerability & Risk Level

Risk represents the probability that a certain source-threat will exploit vulnerability, and the impact of that event on the organization or system. Risk Level is computed based on CVSS version 3.0.

Level	Value	Vulnerability	Risk (Required Action)
<b>Critical</b>	9 - 10	A vulnerability that can disrupt the contract functioning in a number of scenarios, or creates a risk that the contract may be broken.	Immediate action to reduce risk level.
<b>High</b>	7 – 8.9	A vulnerability that affects the desired outcome when using a contract, or provides the opportunity to use a contract in an unintended way.	Implementation of corrective actions as soon as possible.
<b>Medium</b>	4 – 6.9	A vulnerability that could affect the desired outcome of executing the contract in a specific scenario.	Implementation of corrective actions in a certain period.
<b>Low</b>	2 – 3.9	A vulnerability that does not have a significant impact on possible scenarios for the use of the contract and is probably subjective.	Implementation of certain corrective actions or accepting the risk.
<b>Informational</b>	0 – 1.9	A vulnerability that have informational character but is not effecting any of the code.	An observation that does not determine a level of risk

# Auditing Strategy and Techniques Applied

Throughout the review process, care was taken to evaluate the repository for security-related issues, code quality, and adherence to specification and best practices. To do so, reviewed line-by-line by our team of expert pentesters and smart contract developers, documenting any issues as there were discovered.

## Methodology

The auditing process follows a routine series of steps:

1. Code review that includes the following:
  - i) Review of the specifications, sources, and instructions provided to SolidProof to make sure we understand the size, scope, and functionality of the smart contract.
  - ii) Manual review of code, which is the process of reading source code line-by-line in an attempt to identify potential vulnerabilities.
  - iii) Comparison to specification, which is the process of checking whether the code does what the specifications, sources, and instructions provided to SolidProof describe.
2. Testing and automated analysis that includes the following:
  - i) Test coverage analysis, which is the process of determining whether the test cases are actually covering the code and how much code is exercised when we run those test cases.
  - ii) Symbolic execution, which is analysing a program to determine what inputs causes each part of a program to execute.
3. Best practices review, which is a review of the smart contracts to improve efficiency, effectiveness, clarify, maintainability, security, and control based on the established industry and academic practices, recommendations, and research.
4. Specific, itemized, actionable recommendations to help you take steps to secure your smart contracts.

## Used Code from other Frameworks/Smart Contracts (direct imports)

Imported packages:

Dependency / Import Path	Count
@openzeppelin/contracts/access/Ownable.sol	11
@openzeppelin/contracts/token/ERC20/ERC20.sol	1
@openzeppelin/contracts/token/ERC20/IERC20.sol	11
@openzeppelin/contracts/token/ERC20/utils/SafeERC20.sol	11
@openzeppelin/contracts/utils/Counters.sol	1
@openzeppelin/contracts/utils/math/SafeMath.sol	22
hardhat/console.sol	7



## Tested Contract Files

This audit covered the following files listed below with a SHA-1 Hash.

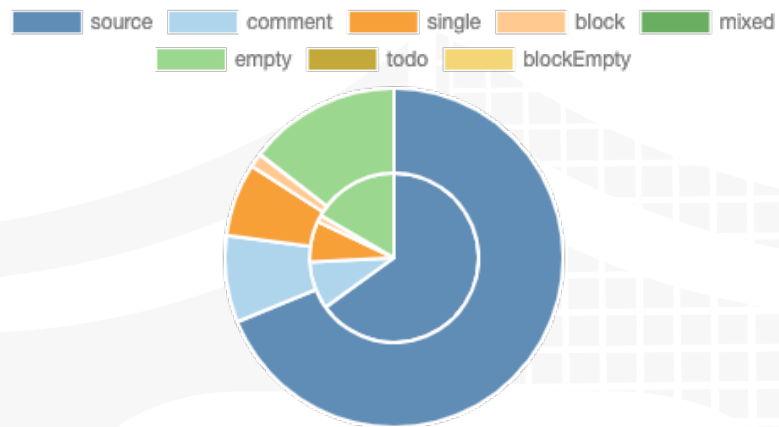
*A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.*

### v1.0

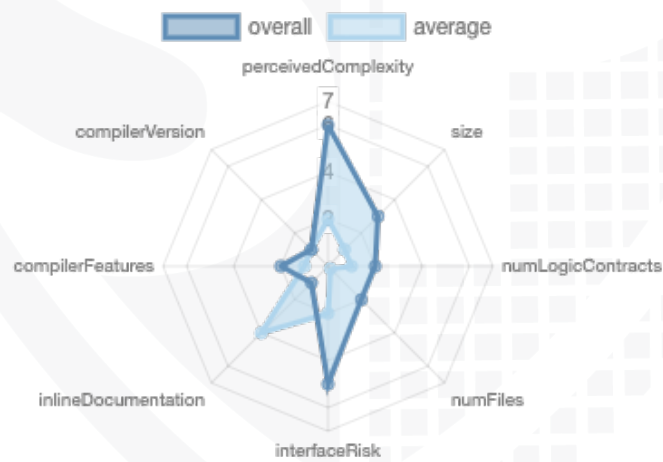
File Name	SHA-1 Hash
contracts/AdvisorVesting.sol	6267a0a42b28834408518f36a01930678921849c
contracts/DaoVesting.sol	211e23d23db27043f0e069da14d3e2ba7bfd76d6
contracts/PrivateSaleVesting.sol	d5f45206ff6a846bf25d4695ae3315c6ddf0f67a
contracts/RewardVesting.sol	4b8b91504756d52c31d6d7949e78baf4c3c892af
contracts/SeedVesting.sol	ace728417b1605b8410e9eab9d491363f93490e8
contracts/RetroRewardVesting.sol	9794c8264ad1283d1af447656f0ee9c8a23b3e1a
contracts/TeamVesting.sol	b21ad0fd4c92a742f90d3697aebb63c12c6d2e6b
contracts/IDOVesting.sol	1175877b44ed85f1eb3cb1541e12b94c6b2b4144
contracts/PrivateVestingOp.sol	8e5975439c80173cd6b04636762c23698c067a8f
contracts/LiquidityVesting.sol	c1dfd1e0ac3ffbe55e30e8011c3d779d2d9c309d
contracts/EcoSystemDevelopmentVesting.sol	633e6e8a808d840883ade158e150adbdb53bb4ed
contracts/lib/BokkyPooBahsDateTimeLibrary.sol	8281c2415a57c619ffd711d29c4007356d42f1fa
contracts/interface/IERC2612Permit.sol	cbb65852689c5580388c4a808d69a48f00a43b0a
contracts/interface/ERC20Permit.sol	017fe499928e0905aacb2eaea97c5951d728e669

# Metrics

## Source Lines v1.0



## Risk Level v1.0



## Capabilities

### Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	11	1	1	1

### Exposed Functions

*This section lists functions that are explicitly declared public or payable. Please note that getter methods for public stateVars are not included.*

Version	Public	Payable
1.0	70	0

Version	External	Internal	Private	Pure	View
1.0	46	119	22	50	35

### State Variables

Version	Total	Public
1.0	80	35

### Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	0.8.6			yes (1 asm blocks)	

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/Create/Create2
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1.0				yes	yes	
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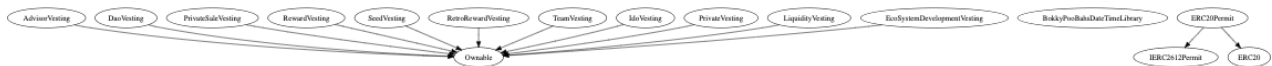
## Scope of Work

The above token Team provided us with the files that needs to be tested (Github, Bscscan, Etherscan, files, etc.). The scope of the audit is the main contract (usual the same name as team appended with .sol).

We will verify the following claims:

1. Correct implementation of Token standard
2. Deployer cannot mint any new tokens
3. Deployer cannot burn or lock user funds
4. Deployer cannot pause the contract
5. Overall checkup (Smart Contract Security)

## Inheritance Graph v1.0



## Verify Claims

### Write functions of contract

addInvestors

recoverToken

renounceOwnership

setInitialTimestamp

transferOwnership

withdrawTokens

## Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

### Legend

Attribute	Symbol
Verified / Checked	✓
Partly Verified	⚠
Unverified / Not checked	✗
Not available	—

## Modifiers

### RewardVesting

- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- ◆ recoverToken
- Ⓜ onlyOwner

### TeamVesting

- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- Ⓜ notInitialized
- ◆ recoverToken
- Ⓜ onlyOwner

### RetroRewardVesti.

- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- Ⓜ notInitialized
- ◆ recoverToken
- Ⓜ onlyOwner

### PrivateVestingOp

- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- Ⓜ notInitialized
- ◆ recoverToken
- Ⓜ onlyOwner

### SeedVes.

- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- Ⓜ notInitialized
- ◆ recoverToken
- Ⓜ onlyOwner

### IDOVesting

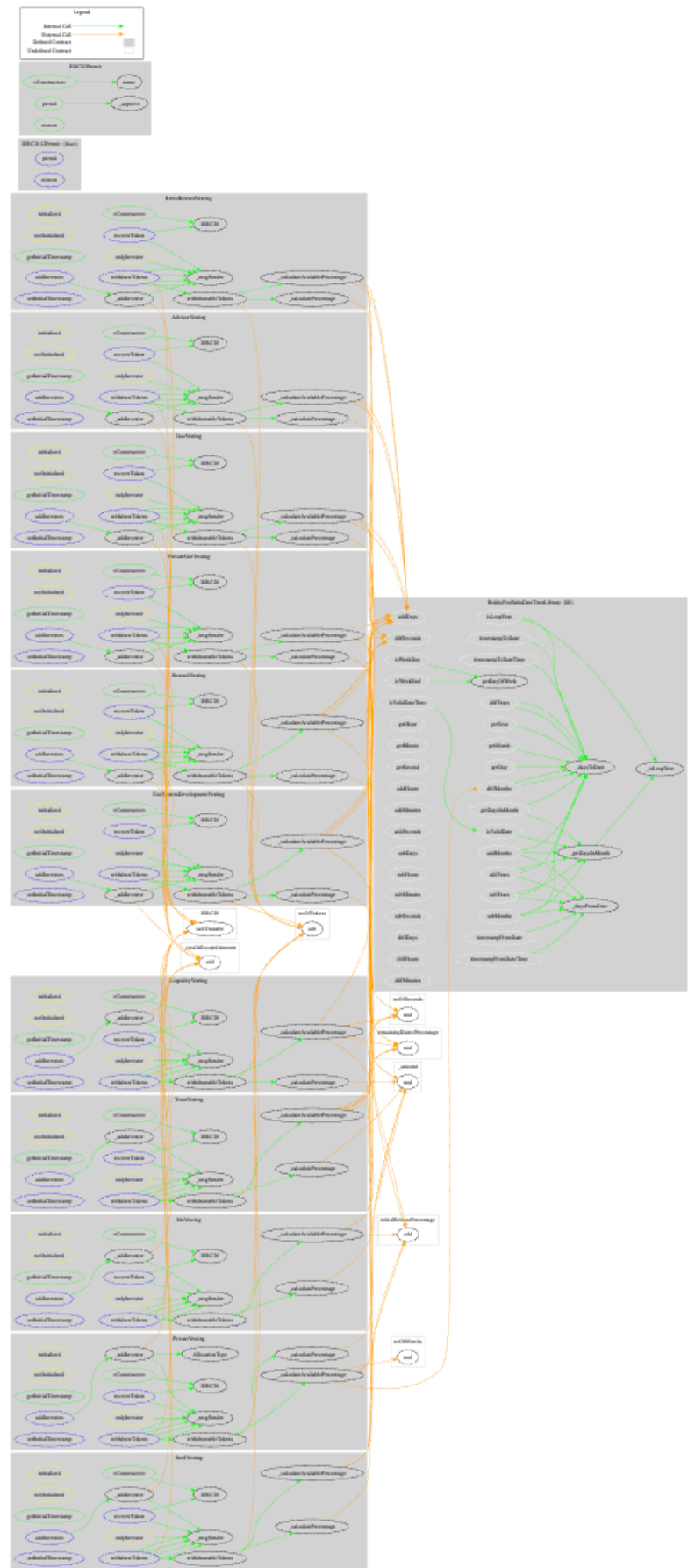
- ◆ addInvestors
- Ⓜ onlyOwner
- ◆ withdrawTokens
- Ⓜ onlyInvestor
- Ⓜ initialized
- ◆ setInitialTimestamp
- Ⓜ onlyOwner
- Ⓜ notInitialized
- ◆ recoverToken
- Ⓜ onlyOwner



## AdvisorVesting


















- ◆ **addInvestors**
  - Ⓜ onlyOwner
- ◆ **withdrawTokens**
  - Ⓜ onlyInvestor
  - Ⓜ initialized
- ◆ **setInitialTimestamp**
  - Ⓜ onlyOwner
- ◆ **recoverToken**
  - Ⓜ onlyOwner

# CallGraph



# Source Units in Scope

## v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/AdvisorVesting.sol	1	————	215	193	143	13	80	————
	contracts/DaoVesting.sol	1	————	215	193	143	13	80	————
	contracts/PrivateSaleVesting.sol	1	————	215	193	137	19	82	————
	contracts/RewardVesting.sol	1	————	220	198	143	17	80	————
	contracts/SeedVesting.sol	1	————	216	194	137	19	82	————
	contracts/RetroRewardVesting.sol	1	————	219	197	143	16	81	————
	contracts/TeamVesting.sol	1	————	216	194	143	12	81	————
	contracts/IDOVesting.sol	1	————	213	191	138	12	82	————
	contracts/PrivateVestingOp.sol	1	————	238	214	155	20	87	————
	contracts/LiquidityVesting.sol	1	————	215	193	137	19	82	————
	contracts/EcoSystemDevelopmentVesting.sol	1	————	215	193	143	13	80	————
	contracts/lib/BokkyPooBahsDateTimeLibrary.sol	1	————	525	376	273	56	82	————
	contracts/interface/IERC2612Permit.sol	————	1	54	41	8	38	5	————
	contracts/interface/ERC20Permit.sol	1	————	85	77	54	10	38	
	<b>Totals</b>	<b>13</b>	<b>1</b>	<b>3061</b>	<b>2647</b>	<b>1897</b>	<b>277</b>	<b>1022</b>	

## Legend

Attribute	Description
Lines	total lines of the source unit
nLines	normalized lines of the source unit (e.g. normalizes functions spanning multiple lines)
nSLOC	normalized source lines of code (only source-code lines; no comments, no blank lines)
Comment Lines	lines containing single or block comments
Complexity Score	a custom complexity score derived from code statements that are known to introduce code complexity (branches, loops, calls, external interfaces, ...)

# Audit Results

## AUDIT PASSED

### Critical issues

- no critical issues found -

### High issues

- no high issues found -

### Medium issues

- no medium issues found -

### Low issues

- no low issues found -

### Informational issues

Issue	File	Type	Line	Description
#1	BokkyP ooBahs DateTim eLibrary	Functions that are not used	57, 242, 219, 359, 368, 328, 377, 308, 490, 499, 508, 464, 282, 265, 231, 286, 291, 278, 300, 274, 210, 182, 195, 223, 227, 428, 437, 446, 406, 455, 386, 124, 132, 150, 162	Remove unused functions
#2	BokkyP ooBahs DateTim eLibrary	Unused state variables	36, 42, 39, 37, 38	Remove unused state variables

## Audit Comments

### 20. December 2021:

- File differences are only in the \_calculateAvailablePercentage
- Token address was not provided to Solidproof



## SWC Attacks

ID	Title	Relationships	Status
<a href="#">SW C-1 36</a>	Unencrypted Private Data On-Chain	<a href="#">CWE-767: Access to Critical Private Variable via Public Method</a>	PASSED
<a href="#">SW C-1 35</a>	Code With No Effects	<a href="#">CWE-1164: Irrelevant Code</a>	PASSED
<a href="#">SW C-1 34</a>	Message call with hardcoded gas amount	<a href="#">CWE-655: Improper Initialization</a>	PASSED
<a href="#">SW C-1 33</a>	Hash Collisions With Multiple Variable Length Arguments	<a href="#">CWE-294: Authentication Bypass by Capture-replay</a>	PASSED
<a href="#">SW C-1 32</a>	Unexpected Ether balance	<a href="#">CWE-667: Improper Locking</a>	PASSED
<a href="#">SW C-1 31</a>	Presence of unused variables	<a href="#">CWE-1164: Irrelevant Code</a>	NOT PASSED
<a href="#">SW C-1 30</a>	Right-To-Left-Override control character (U+202E)	<a href="#">CWE-451: User Interface (UI) Misrepresentation of Critical Information</a>	PASSED
<a href="#">SW C-1 29</a>	Typographical Error	<a href="#">CWE-480: Use of Incorrect Operator</a>	PASSED
<a href="#">SW C-1 28</a>	DoS With Block Gas Limit	<a href="#">CWE-400: Uncontrolled Resource Consumption</a>	PASSED

<a href="#">SW C-1 27</a>	Arbitrary Jump with Function Type Variable	<a href="#">CWE-695: Use of Low-Level Functionality</a>	<b>PASSED</b>
<a href="#">SW C-1 25</a>	Incorrect Inheritance Order	<a href="#">CWE-696: Incorrect Behavior Order</a>	<b>PASSED</b>
<a href="#">SW C-1 24</a>	Write to Arbitrary Storage Location	<a href="#">CWE-123: Write-what-where Condition</a>	<b>PASSED</b>
<a href="#">SW C-1 23</a>	Requirement Violation	<a href="#">CWE-573: Improper Following of Specification by Caller</a>	<b>PASSED</b>
<a href="#">SW C-1 22</a>	Lack of Proper Signature Verification	<a href="#">CWE-345: Insufficient Verification of Data Authenticity</a>	<b>PASSED</b>
<a href="#">SW C-1 21</a>	Missing Protection against Signature Replay Attacks	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>
<a href="#">SW C-1 20</a>	Weak Sources of Randomness from Chain Attributes	<a href="#">CWE-330: Use of Insufficiently Random Values</a>	<b>PASSED</b>
<a href="#">SW C-11 9</a>	Shadowing State Variables	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW C-11 8</a>	Incorrect Constructor Name	<a href="#">CWE-665: Improper Initialization</a>	<b>PASSED</b>
<a href="#">SW C-11 7</a>	Signature Malleability	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>

<a href="#">SW C-11 6</a>	Timestamp Dependence	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	<b>PASSED</b>
<a href="#">SW C-11 5</a>	Authorization through tx.origin	<a href="#">CWE-477: Use of Obsolete Function</a>	<b>PASSED</b>
<a href="#">SW C-11 4</a>	Transaction Order Dependence	<a href="#">CWE-362: Concurrent Execution using Shared Resource with Improper Synchronization ('Race Condition')</a>	<b>PASSED</b>
<a href="#">SW C-11 3</a>	DoS with Failed Call	<a href="#">CWE-703: Improper Check or Handling of Exceptional Conditions</a>	<b>PASSED</b>
<a href="#">SW C-11 2</a>	Delegatecall to Untrusted Callee	<a href="#">CWE-829: Inclusion of Functionality from Untrusted Control Sphere</a>	<b>PASSED</b>
<a href="#">SW C-11 1</a>	Use of Deprecated Solidity Functions	<a href="#">CWE-477: Use of Obsolete Function</a>	<b>PASSED</b>
<a href="#">SW C-11 0</a>	Assert Violation	<a href="#">CWE-670: Always-Incorrect Control Flow Implementation</a>	<b>PASSED</b>
<a href="#">SW C-1 09</a>	Uninitialized Storage Pointer	<a href="#">CWE-824: Access of Uninitialized Pointer</a>	<b>PASSED</b>
<a href="#">SW C-1 08</a>	State Variable Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW C-1 07</a>	Reentrancy	<a href="#">CWE-841: Improper Enforcement of Behavioral Workflow</a>	<b>PASSED</b>
<a href="#">SW C-1 06</a>	Unprotected SELFDESTRUCT Instruction	<a href="#">CWE-284: Improper Access Control</a>	<b>PASSED</b>



<a href="#">SW</a> <a href="#">C-1</a> <a href="#">05</a>	Unprotected Ether Withdrawal	<a href="#">CWE-284: Improper Access Control</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">04</a>	Unchecked Call Return Value	<a href="#">CWE-252: Unchecked Return Value</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">03</a>	Floating Pragma	<a href="#">CWE-664: Improper Control of a Resource Through its Lifetime</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">02</a>	Outdated Compiler Version	<a href="#">CWE-937: Using Components with Known Vulnerabilities</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">01</a>	Integer Overflow and Underflow	<a href="#">CWE-682: Incorrect Calculation</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">00</a>	Function Default Visibility	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>

The logo features the words "Solid Proofed" in a white, elegant script font. The word "Solid" is positioned above "Proofed". Behind the text is a faint, stylized shield emblem with a grid-like pattern, rendered in a darker shade of blue. The entire composition is set against a solid blue background.

Solid  
Proofed

**Blockchain Security | Smart Contract Audits | KYC**

A small horizontal bar representing the German flag, with black, red, and gold stripes.

MADE IN GERMANY