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

MADE IN GERMANY

# Audit

**Security Assessment**  
**03. January, 2022**

**For**



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# Disclaimer

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Version	Date	Description
1.0	03. January 2022	<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://trypledge.org/>

## **Telegram**

<https://t.me/ThePledgeCoin>

## **Twitter**

<https://www.twitter.com/thepledgecoin>

## **Facebook**

<https://www.facebook.com/thepledgecoin>

## **Instagram**

<https://www.instagram.com/thepledgecoin>

## Description

Our mission is to be a force for the greater good. Specifically we intend to do this by powering charitable giving, and charitable initiatives through block chain solutions.

## Project Engagement

During the 30th of December 2021, **Pledge Utility Coin 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

- Github
  - <https://github.com/Pledge-Utility-Coin-Token/solidity-contracts/tree/dev/contracts>
  - Commit: 129ff75a1ledc9f3235f478493e7197a63ca4c9d

# 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:

IPancakeFactory


IPancakePair

IPancakeERC20

 SafeMath

PancakeERC20

 Math

 UQ112x112

IERC20

IPancakeCallee

PancakePair

PancakeFactory



## Tested Contract Files

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

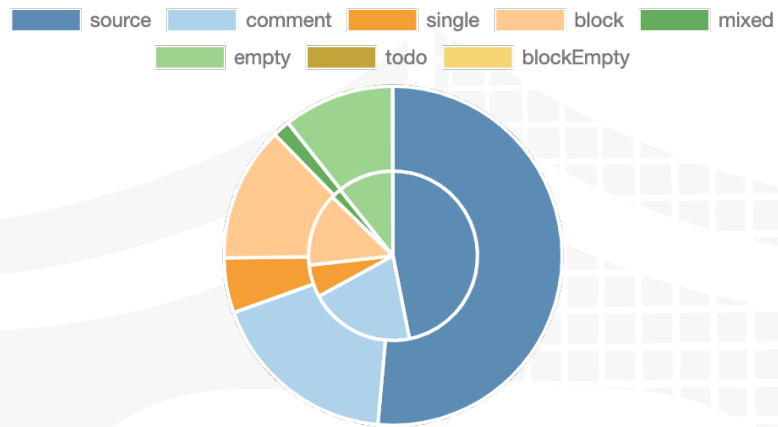
*A file with a different Hash has been modified, intentionally or otherwise, after the security review. A different Hash could be (but not necessarily) an indication of a changed condition or potential vulnerability that was not within the scope of this review.*

### v1.0

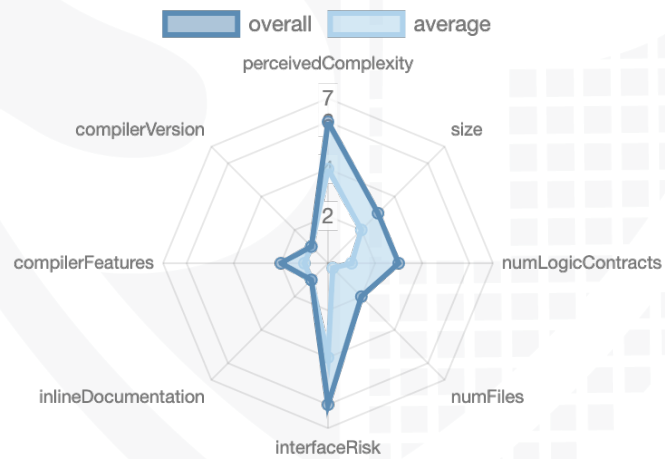
File Name	SHA-1 Hash
contracts/Pledge01Up.sol	2384a496b9271bb10b097fe06584fc23b84d26b3
contracts/weth.sol	a591cb13cf771aa6f0a05c5db82b11673a859dfb
contracts/PancakeRouter.sol	1306ed3fa9fe406a731f5115c214bb2d3221768b
contracts/Open-Zeppelin.sol	c31be077a9f134edaaade67b48ea63618e912b40
contracts/Pledge02Up.sol	11d3679ec6f18a0b28c0ebb3b2a98a792963562d
contracts/Safemath.sol	d7243fa694de96304176b5afee0e5881f32cc146
contracts/PancakeFactory.sol	97281475aec2393ae7f7cce2970423bf086b9566

# Metrics

## Source Lines v1.0



## Risk Level v1.0



## Capabilities

### Components

Version	Contracts	Libraries	Interfaces	Abstract
1.0	11	10	18	4

### 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	314	13

Version	External	Internal	Private	Pure	View
1.0	255	303	11	65	118

### State Variables

Version	Total	Public
1.0	108	79

### Capabilities

Version	Solidity Versions observed	Experimental Features	Can Receive Funds	Uses Assembly	Has Destroyable Contracts
1.0	0.6.12 ^0.6.12 =0.6.12 =0.5.16	ABIEncoderV2	yes	yes (4 asm blocks)	

Version	Transfers ETH	Low-Level Calls	DelegateCall	Uses Hash Functions	ECRecover	New/ Create/ Create2
1.0	yes			yes	yes	yes → Assembly Call: Name: create2



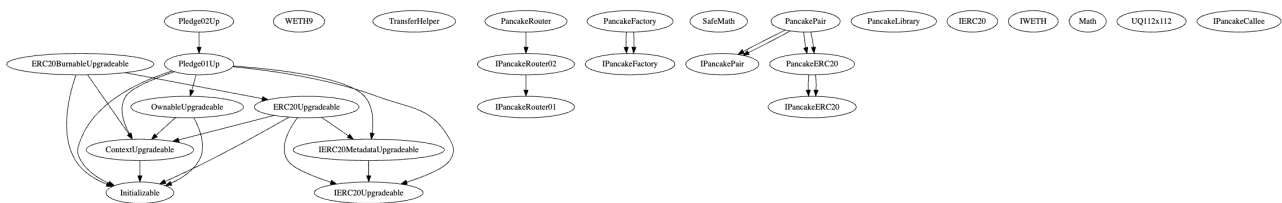
## Scope of Work

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

### Correct implementation of Token standard

Tested	Verified
✓	✓

Function	Description	Exist	Tested	Verified
TotalSupply	provides information about the total token supply	✓	✓	✓
BalanceOf	provides account balance of the owner's account	✓	✓	✓
Transfer	executes transfers of a specified number of tokens to a specified address	✓	✓	✓
TransferFrom	executes transfers of a specified number of tokens from a specified address	✓	✓	✓
Approve	allow a spender to withdraw a set number of tokens from a specified account	✓	✓	✓
Allowance	returns a set number of tokens from a spender to the owner	✓	✓	✓

## Write functions of contract

Pledge01Up

__Pledge_init	restoreFees
__Pledge_init_unchained	setBeneficiaries
addCharityAddress	setFees
approve	setGeneralCharityAddress
burn	setMaxTransferAmount
burnFrom	setMinHoldTimeSec
changeCharityAddress	transfer
createLiquidityPool	transferFrom
decreaseAllowance	transferOwnership
freeFromFees	
freeFromTransferLimit	
increaseAllowance	
initialize	
preferCharityAddress	
removeCharityAddress	
renounceOwnership	

## Pledge02Up

__Pledge_init	restoreFees
__Pledge_init_unchained	setBeneficiaries
__PledgeV2_init	setFees
__PledgeV2_init_unchained	setGeneralCharityAddress
addCharityAddress	setMaxTransferAmount
approve	setMinHoldTimeSec
burn	transfer
burnFrom	transferFrom
changeCharityAddress	transferOwnership
createLiquidityPool	
decreaseAllowance	
freeFromFees	
freeFromTransferLimit	
increaseAllowance	
initialize	
preferCharityAddress	
removeCharityAddress	



## Deployer cannot mint any new tokens

Name	Exist	Tested	Verified
Deployer cannot mint	✓	✓	✓

Max / Total Supply: 1.000.000.000.000.000



## Deployer cannot burn or lock user funds

Name	Exist	Tested	Verified
Deployer cannot lock	✓	✓	✗
Deployer cannot burn	✓	✓	✓

Comments:

### v1.0

- Everybody can burn tokens
- Deployer can lock user funds
  - By setting maxTransferAmount to 0

```
732 function _settleCharityRelation(address sender, address recipient) internal virtual {
733     // transferring directly to a charity that is not yet preferred.
734     if(isCharityAddress[recipient] == true && preferredCharityAddress[sender] == address(0)) {
735         preferredCharityAddress[sender] = recipient;
736         beneficiaries.charity = recipient;
737     } else {
738         // which charity to pay charity fees to?
739         beneficiaries.charity = generalCharityAddress;
740         address preferred = preferredCharityAddress[sender];
741         if( preferred != address(0) && isCharityAddress[preferred] ) { // && preferredCharityAddress[sender] != generalCharityAddress) {
742             // isCharityAddress[preferred] is required because the owner can freely remove a charity address without knowing if its a holder's preferred charity.
743             beneficiaries.charity = preferredCharityAddress[sender];
744         }
745         require(beneficiaries.charity != address(0), "Invalid charity");
746     }
747 }
```

## Deployer cannot pause the contract

Name	Exist	Tested	Verified
Deployer cannot pause	—	—	—



## Overall checkup (Smart Contract Security)

Tested	Verified
✓	✓

### Legend

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

# Modifiers

Pledger01Up

◆ initialize

Ⓜ initializer

◆ restoreFees

Ⓜ onlyOwner

◆ setMinHoldTimeSec

Ⓜ onlyOwner

◆ setMaxTransferAmount

Ⓜ onlyOwner

◆ setBeneficiaries

Ⓜ onlyOwner

◆ createLiquidityPool

Ⓜ onlyOwner

◆ setFees

Ⓜ onlyOwner

◆ freeFromFees

Ⓜ onlyOwner

◆ freeFromTransferLimit

Ⓜ onlyOwner

◆ setGeneralCharityAddress

Ⓜ onlyOwner

◆ addCharityAddress

Ⓜ onlyOwner

◆ removeCharityAddress

Ⓜ onlyOwner

◆ changeCharityAddress

Ⓜ onlyOwner

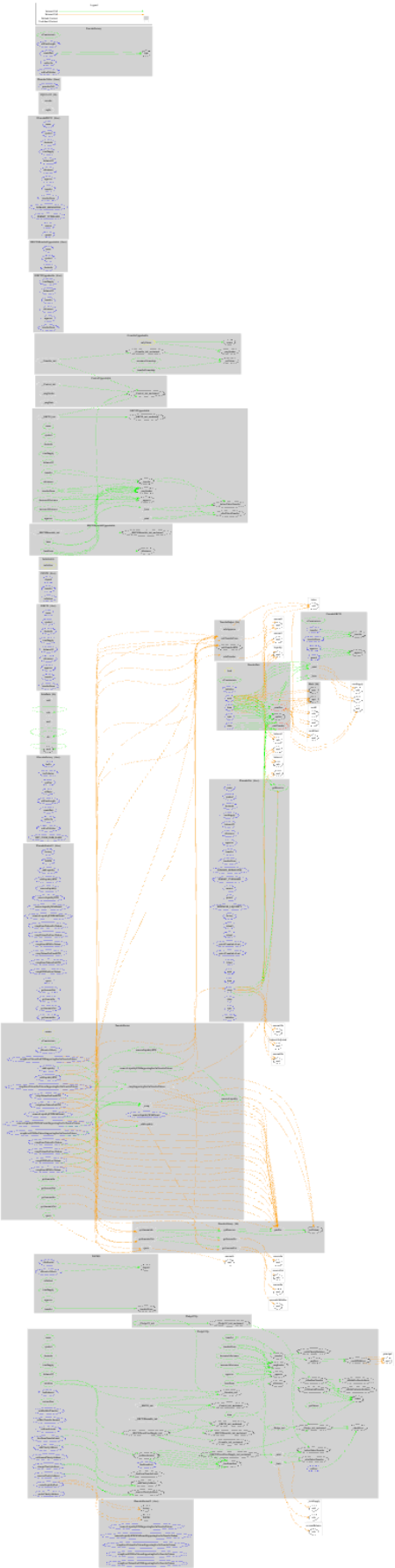
## Comments

- Deployer can set following state variables without any limitations
  - minHoldTimeSec
  - maxTransferAmount
  - beneficiaries
- Deployer can enable/disable following state variables
  - isFeeFree

- `isTransferLimitFree`
- `isCharityAddress`



# CallGraph



# Source Units in Scope

## v1.0

Type	File	Logic Contracts	Interfaces	Lines	nLines	nSLOC	Comment Lines	Complex. Score	Capabilities
	contracts/Pledge01Up.sol	1	————	782	757	394	253	298	
	contracts/weth.sol	1	————	75	72	50	7	45	
	contracts/PancakeRouter.sol	4	6	819	434	360	40	581	
	contracts/Open-Zeppelin.sol	5	2	575	487	194	286	176	
	contracts/Pledge02Up.sol	1	————	29	29	14	5	12	
	contracts/Safemath.sol	1	————	139	139	40	86	10	
	contracts/PancakeFactory.sol	12	10	1015	827	646	116	868	
	<b>Totals</b>	<b>25</b>	<b>18</b>	<b>3434</b>	<b>2745</b>	<b>1698</b>	<b>793</b>	<b>1990</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

Issue	File	Type	Line	Description
#1	PancakeRouter	Unchecked tokens transfer	486	Use `SafeERC20`, or ensure that the transfer/transferFrom return value is checked
#2	Pledge01Up	The arithmetic operation can underflow	178,688	It is possible to cause an arithmetic underflow. Please use libraries like SafeMath from openZeppelin to prevent underflows

## Low issues

Issue	File	Type	Line	Description
#1	Main	Contract doesn't import npm packages from source (like OpenZeppelin etc.)	-	We recommend to import all packages from npm directly without flatten the contract. Functions could be modified or can be susceptible to vulnerabilities
#2	Main	A floating pragma is set	2	The current pragma Solidity directive is „^0.6.12“.
#3	Main	Missing Zero Address Validation (missing-zero-check)	396, 620	Check that the address is not zero

## Informational issues

Issue	File	Type	Line	Description
#1	Weth	State variables that could be declared constant (constable-states)	6, 7, 8	Add the `constant` attributes to state variables that never change
#2	PancakeRouter	Unused return values	416	Ensure that all the return values of the function calls are used and handle both success and failure cases if needed by the business logic
#3	PancakeRouter	Functions that are not used	406	Remove unused functions
#4	PancakeFactory	SPDX License Identifier is missing	-	Add SPDX License Identifier to the source file

## Audit Comments

### 03. January 2022:

- [Deployer can lock user funds](#)
- [Read whole report for more information](#)

## 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>	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</a> <a href="#">C-1</a> <a href="#">27</a>	Arbitrary Jump with Function Type Variable	<a href="#">CWE-695: Use of Low-Level Functionality</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">25</a>	Incorrect Inheritance Order	<a href="#">CWE-696: Incorrect Behavior Order</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">24</a>	Write to Arbitrary Storage Location	<a href="#">CWE-123: Write-what-where Condition</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">23</a>	Requirement Violation	<a href="#">CWE-573: Improper Following of Specification by Caller</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">22</a>	Lack of Proper Signature Verification	<a href="#">CWE-345: Insufficient Verification of Data Authenticity</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">21</a>	Missing Protection against Signature Replay Attacks	<a href="#">CWE-347: Improper Verification of Cryptographic Signature</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-1</a> <a href="#">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</a> <a href="#">C-11</a> <a href="#">9</a>	Shadowing State Variables	<a href="#">CWE-710: Improper Adherence to Coding Standards</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-11</a> <a href="#">8</a>	Incorrect Constructor Name	<a href="#">CWE-665: Improper Initialization</a>	<b>PASSED</b>
<a href="#">SW</a> <a href="#">C-11</a> <a href="#">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>NOT 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>NOT 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.

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