Smart Contract Security Audit V1

Sonokinetic Retro Plates Smart Contract

https://www.sonokinetic.net/

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Background

The purpose of the audit was to achieve the following:

- Ensure that the smart contract functions as intended.
- Identify potential security issues with the smart contract.

The information in this report should be used to understand the risk exposure of the smart contract, and as a guide to improve the security posture of the smart contract by remediating the issues that were identified.

Project Information

• Mint Page: https://sonokinetic-retroplates.netlify.app/

• Opensea: https://opensea.io/collection/sonokinetic-retroplates

• Twitter: https://twitter.com/sonotweet

• Instagram: https://www.instagram.com/sonokinetic/

• **Platform**: Ethereum

Contract Address: 0xD903436bD780359C088B462Aa9C513C179Ec8783

• Code:

https://etherscan.io/address/0xD903436bD780359C088B462Aa9C513C179Ec8783#code

NFT Information

• Name: Sonokinetic Retro Plates

• MAX Supply: 1000

Contracts address deployed to test net (Ethereum)

Sonokinetic Retro Plates smart contract on Ethereum test net to test every function by the auditor.

https://goerli.etherscan.io/address/0x36c4c54c817aff6af1d2db2dc3057e98899e7baf

Executive Summary

According to our assessment, the customer's solidity smart contract is "WELL SECURED".

Well Secured	√
Secured	
Poor Secured	
Insecure	

Automated checks are with remix IDE. All issues were performed by the team, which included the analysis of code functionality, manual audit found during automated analysis were manually reviewed and applicable vulnerabilities are presented in the audit overview section. The general overview is presented in the Project Information section and all issues found are located in the audit overview section.

Team found 0 critical, 0 high, 0 medium, 4 low, 0 very low-level issues and 0 note in all solidity files of the contract

The files:

SonokineticRetroPlates.sol

File and Function Level Report

File in Scope:

Contract Name	SHA 256 hash	Contract Address
SonokineticRetroPlates.s ol	7f970d3ab2d79a0c0be487a a7ed035264cd8c90eb953d8 5f400e7df793818316	0xD903436bD780359C088B462Aa9C513C179 Ec8783

• Contract: SonokineticRetroPlates

• Inherit: ERC721AQueryable, Ownable, ReentrancyGuard

• Observation: All passed including security check

Test Report: passedScore: passed

• Conclusion: passed

Function	Test Result	Type / Return Type	Score
name	√	Read / public	Passed
symbol	✓	Read / public	Passed
explicitOwnershipOf	√	Read / public	Passed
supportsInterface	✓	Read / public	Passed
explicitOwnershipOf	✓	Read / public	Passed
balanceOf	✓	Read / public	Passed
Owner	✓	Read / public	Passed
cost	✓	Read / public	Passed
whitelistMintEnabled	✓	Read / public	Passed
getApprovedForAll	✓	Read / public	Passed
hiddenMetadataUri	√	Read / public	Passed
getApproved	√	Read / public	Passed

ownerOf	√	Read / public	Passed
tokenURI	√	Read / public	Passed
totalSupply	√	Read / public	Passed
maxSupply	√	Read / public	Passed
merkleRoot	√	Read / public	Passed
maxMintAmountPerTx	√	Read / public	Passed
tokensOfOwnerIn	√	Read / public	Passed
tokensOfOwner	✓	Read / public	Passed
paused	√	Read / public	Passed
revealed	√	Read / public	Passed
uriPrefix	√	Read / public	Passed
uriSuffix	√	Read / public	Passed
whitelistClaimed	√	Read / public	Passed
mint	√	Write / payable	Passed
approve	√	Write / public	Passed
safeTransferFrom	✓	Write / public	Passed
safeTransferFrom	✓	Write / public	Passed
setHiddenMetadataUri	√	Write / public	Passed
withdraw	√	Write / public	Passed
setCost	✓	Write / public	Passed
transferOwnership	✓	Write / public	Passed
setApprovalForAll	√	Write / public	Passed
transferFrom	√	Write / public	Passed
setMaxMintAmountPerTx	√	Write / public	Passed
renounceOwnership	√	Write / public	Passed
mintForAddress	√	Write / public	Passed
setUriPrefix	√	Write / public	Passed

whitelistMint	√	Write / payable	Passed
setPaused	✓	Write / public	Passed
setBaseURI	✓	Write / public	Passed
setMerkleRoot	✓	Write / public	Passed
setRevealed	✓	Write / public	Passed
setUriSuffix	√	Write / public	Passed

Issues Checking Status

No.	Issue Description	Checking Status
1	Compiler warnings.	Passed
2	Race conditions and Reentrancy. Cross-function race conditions.	
3	Possible delays in data delivery.	Passed
4	Oracle calls.	Passed
5	Design Logic.	Passed
6	Timestamp dependence. Passed with Notes	
7	Integer Overflow and Underflow. Passed	
8	DoS with Revert.	Passed
9	DoS with block gas limit. Passed with Notes	
10	Methods execution permissions.	Passed
11	Economy model. If application logic is based on an incorrect economic model, the application would not function correctly and participants would incur financial losses. This type of issue is most often found in bonus rewards systems, Staking and Farming contracts, Vault and Vesting contracts, etc.	
12	The impact of the exchange rate on the logic.	Passed
13	Private user data leaks. Passed	
14	Malicious Event log.	Passed
15	Scoping and Declarations.	Passed
16	Uninitialized storage pointers.	Passed
17	Arithmetic accuracy. Passed	

Severity Definitions

Risk Level	Description
Critical	Critical vulnerabilities are usually straightforward to exploit and can lead to tokens loss etc.
High	High-level vulnerabilities are difficult to exploit; however, they also have significant impact on smart contract execution, e.g. public access to crucial functions
Medium	Medium-level vulnerabilities are important to fix; however, they can't lead to tokens lose
Low	Low-level vulnerabilities are mostly related to outdated, unused etc. code snippets, that can't have significant impact on execution
Note	Lowest-level vulnerabilities, code style violations and info statements can't affect smart contract execution and can be ignored.

Audit Findings

Critical:

No Critical severity vulnerabilities were found.

High:

No High severity vulnerabilities were found.

Medium:

No Medium severity vulnerabilities were found

Low:

#Missing zero address validation

Description

When the owner wants to mint some NFT to investors, he has to check for the zero address to make, he didn't add the zero address. Otherwise, the mint for address function will act like the burn function.

```
function mintForAddress(uint256 _mintAmount, address _receiver) public
mintCompliance(_mintAmount) onlyOwner {
    _safeMint(_receiver, _mintAmount);
}
```

Remediation

Use the require statement to check for zero addresses.

Status: Acknowledged

#Use of block.timestamp for comparisons

Description

The value of block.timestamp can be manipulated by the miner. And conditions with strict equality is difficult to achieve - block.timestamp

Remediation

Avoid use of block.timestamp

Status: Acknowledged

#Pragam version not fixed

Description

It is a good practice to lock the solidity version for a live deployment (use 0.8.17 instead of >=0.8.9 < 0.9.0). contracts should be deployed with the same compiler version and flags that they have been tested the most with. Locking the pragma helps ensure that contracts do not accidentally get deployed using, for example, the latest compiler which may have higher risks of undiscovered bugs. Contracts may also be deployed by others and the pragma indicates the compiler version intended by the original authors.

Remediation

Remove the \geq = < signs to lock the pragma version.

Status: Acknowledged

#Owner privileges (In the period when the owner isn't renounced)

Description

The owner can mint NFT to any address.

The owner can pause and un pause the contract.

The owner can change the price at any stage.

```
function mintForAddress(uint256 _mintAmount, address _receiver) public
mintCompliance(_mintAmount) onlyOwner {
    _safeMint(_receiver, _mintAmount);}
function setCost(uint256 _cost) public onlyOwner {
    cost = _cost; }
    function setPaused(bool _state) public onlyOwner {
        paused = _state;}
    function setWhitelistMintEnabled(bool _state) public onlyOwner {
        whitelistMintEnabled = _state;}
```

Remediation

Make these functions internal in next version or the team should announce the investors before doing anything to give them time if they want to do anything.

P.S: This issue is common to the majority of NFT smart contracts.

Status: Acknowledged.

Very Low:

No Very Low severity vulnerabilities were found.

Notes:

No Notes vulnerabilities were found.

Automatic Testing

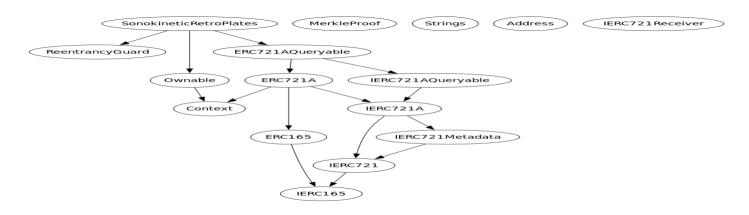
1- Check for security



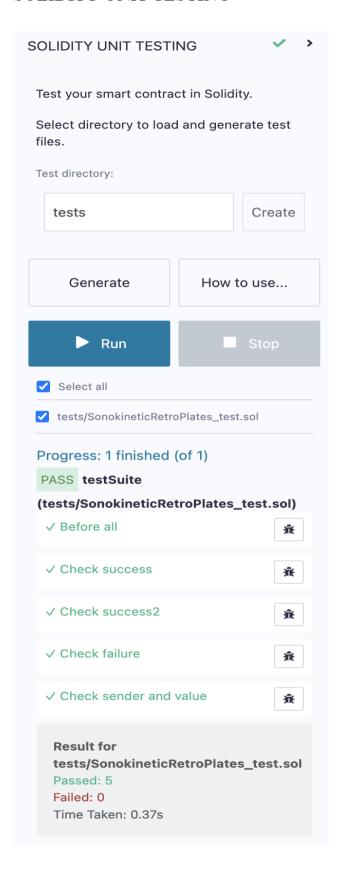
2- SOLIDITY STATIC ANALYSIS



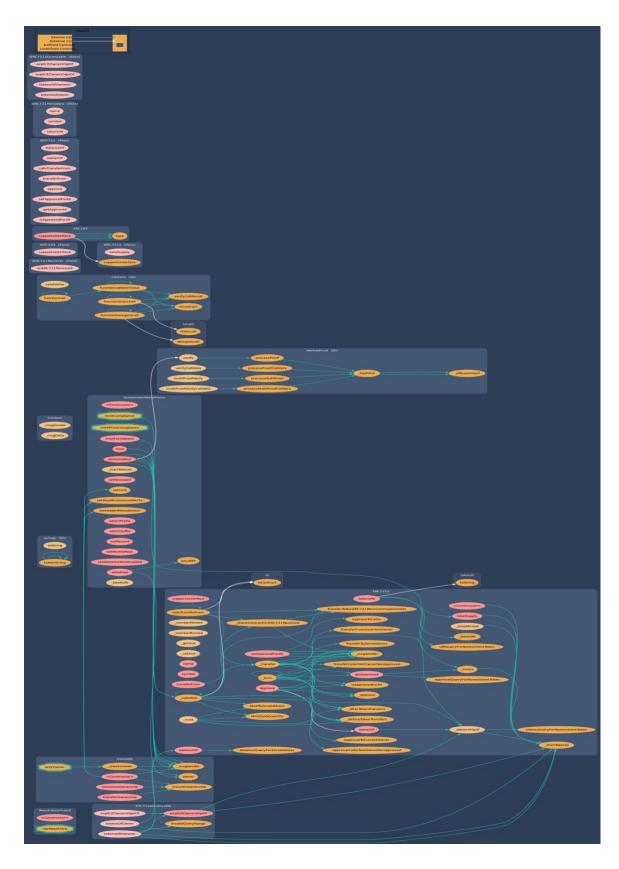
3- Inheritance graph



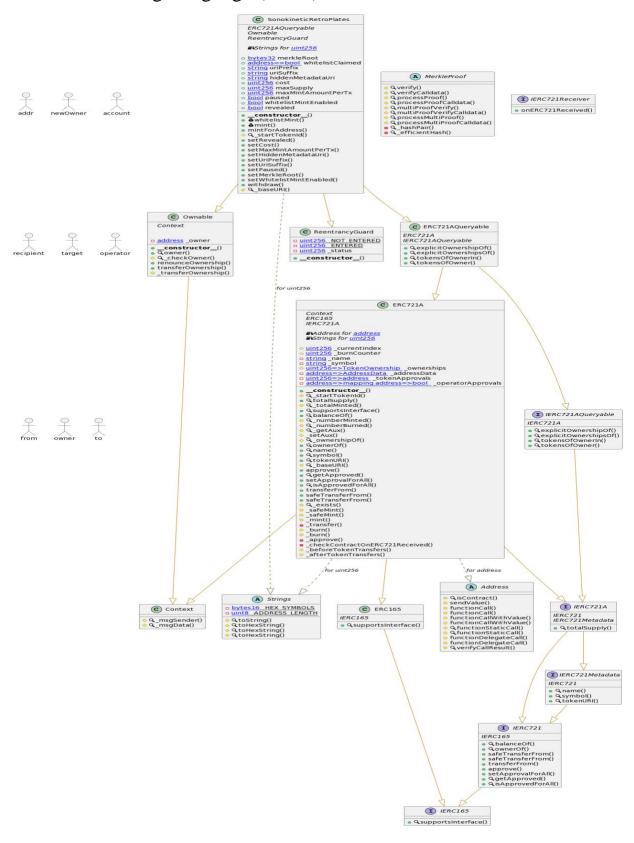
4- SOLIDITY UNIT TESTING



5- Call graph



Unified Modeling Language (UML)



Functions signature

```
Sighash | Function Signature
_____
16279055 => isContract(address)
86333816 => multiProofVerify(bytes32[],bool[],bytes32,bytes32[])
5a9a49c7 => verify(bytes32[],bytes32,bytes32)
7ffe9d8c => verifyCalldata(bytes32[],bytes32,bytes32)
62702a6b => processProof(bytes32[],bytes32)
53b0f85f => processProofCalldata(bytes32[],bytes32)
862aac96 => multiProofVerifyCalldata(bytes32[],bool[],bytes32,bytes32[])
ea5d3eb6 => processMultiProof(bytes32[],bool[],bytes32[])
32712d22 => processMultiProofCalldata(bytes32[],bool[],bytes32[])
00a4cf28 => _hashPair(bytes32,bytes32)
41ed615b => _efficientHash(bytes32,bytes32)
6900a3ae => toString(uint256)
8fba8d5c => toHexString(uint256)
63e1cbea => toHexString(uint256, uint256)
1bb0c665 => toHexString(address)
119df25f => _msgSender()
8b49d47e => _msgData()
8da5cb5b => owner()
53a72975 => _checkOwner()
715018a6 => renounceOwnership()
f2fde38b => transferOwnership(address)
d29d44ee => transferOwnership(address)
24a084df => sendValue(address, uint256)
a0b5ffb0 => functionCall(address,bytes)
241b5886 => functionCall(address,bytes,string)
2a011594 => functionCallWithValue(address, bytes, uint256)
d525ab8a => functionCallWithValue(address, bytes, uint256, string)
c21d36f3 => functionStaticCall(address,bytes)
dbc40fb9 => functionStaticCall(address, bytes, string)
ee33b7e2 => functionDelegateCall(address, bytes)
57387df0 => functionDelegateCall(address,bytes,string)
946b5793 => verifyCallResult(bool,bytes,string)
150b7a02 => onERC721Received(address,address,uint256,bytes)
01ffc9a7 => supportsInterface(bytes4)
70a08231 => balanceOf(address)
6352211e => ownerOf(uint256)
b88d4fde => safeTransferFrom(address,address,uint256,bytes)
42842e0e => safeTransferFrom(address,address,uint256)
23b872dd => transferFrom(address,address,uint256)
095ea7b3 => approve(address,uint256)
a22cb465 => setApprovalForAll(address, bool)
081812fc => getApproved(uint256)
e985e9c5 => isApprovedForAll(address,address)
06fdde03 => name()
95d89b41 => symbol()
c87b56dd => tokenURI(uint256)
18160ddd => totalSupply()
98995f77 => _startTokenId()
736bf591 => _totalMinted()
4d388a98 => _numberMinted(address)
6ba1b8d0 => _numberBurned(address)
```

```
f4a540c5 => _getAux(address)
4ff8c452 => _setAux(address,uint64)
fb372cf2 => _ownershipOf(uint256)
743976a0 => _baseURI()
f8e76cc0 => _exists(uint256)
b3e1c718 => _safeMint(address,uint256)
6a4f832b => _safeMint(address,uint256,bytes)
4e6ec247 => _mint(address,uint256)
30e0789e => _transfer(address,address,uint256)
9b1f9e74 => _burn(uint256)
834a9477 => _burn(uint256,bool)
f272404d => _approve(address,uint256,address)
d88343e2 => _checkContractOnERC721Received(address,address,uint256,bytes)
ef435773 => _beforeTokenTransfers(address,address,uint256,uint256)
08c018f7 => _afterTokenTransfers(address,address,uint256,uint256)
explicitOwnershipOf(uint256)
 f4a540c5 => _getAux(address)
c23dc68f => explicitOwnershipOf(uint256)
 5bbb2177 => explicitOwnershipsOf(uint256[])
 99a2557a => tokensOfOwnerIn(address, uint256, uint256)
 8462151c => tokensOfOwner(address)
 d2cab056 => whitelistMint(uint256,bytes32[])
 a0712d68 => mint(uint256)
 efbd73f4 => mintForAddress(uint256,address)
 e0a80853 => setRevealed(bool)
 44a0d68a => setCost(uint256)
b071401b => setMaxMintAmountPerTx(uint256)
 4fdd43cb => setHiddenMetadataUri(string)
 7ec4a659 => setUriPrefix(string)
 16ba10e0 => setUriSuffix(string)
 16c38b3c => setPaused(bool)
 7cb64759 => setMerkleRoot(bytes32)
b767a098 => setWhitelistMintEnabled(bool)
```

3ccfd60b => withdraw()

Automatic general report

```
Files Description Table
| File Name | SHA-1 Hash |
|-----|
| /Users/macbook/Desktop/smart contracts/SonokineticRetroPlates.sol |
3cae8ea60a5e54427ce24395b8431d684b07c1fe |
Contracts Description Table
                 Type | Bases |
| Contract |
| **Function Name** | **Visibility** | **Mutability** |
**Modifiers** |
| **ReentrancyGuard** | Implementation | |||
| **MerkleProof** | Library | |||
| L | verify | Internal 🖺 | | |
| L | verifyCalldata | Internal 🗎 | | |
| L | processProof | Internal 🖺 | | |
| L | processProofCalldata | Internal 🖺 |
 L | multiProofVerify | Internal A | | |
| L | multiProofVerifyCalldata | Internal 🖺 | | | |
 L | processMultiProof | Internal 🖺 | | |
 L | processMultiProofCalldata | Internal 🖺 | | |
| L | hashPair | Private 🖺 | | |
| L | _efficientHash | Private 🖺 | | |
 **Strings** | Library | |||
| L | toString | Internal A |
| **Context** | Implementation | |||
 L | msgData | Internal 🖺 | | |
| **Ownable** | Implementation | Context | | |
| Constructor> | Public | | NO | |
 L | owner | Public | | NO | |
 L | checkOwner | Internal A |
 L | renounceOwnership | Public | | onlyOwner | L | transferOwnership | Public | | onlyOwner |
 L | transferOwnership | Internal 🖺 | 🔘 | |
| L | isContract | Internal A | | | |
| L | sendValue | Internal 🖺 | 🔘 | |
| L | functionCall | Internal A |
| L | functionCall | Internal A | | | |
 L | functionCallWithValue | Internal |
| L | functionCallWithValue | Internal 🖺 |
| L | functionStaticCall | Internal A | | |
```

```
| L | functionStaticCall | Internal A |
| L | functionDelegateCall | Internal A | O
| L | functionDelegateCall | Internal 🖺 | 🔘
| L | verifyCallResult | Internal A | | | |
| **IERC721Receiver** | Interface | ||
| L | onERC721Received | External [ | ①
| **IERC165** | Interface | ||| | |
| L | supportsInterface | External | | NO |
| **ERC165** | Implementation | IERC165 |||
| L | supportsInterface | Public | | NO | |
| **IERC721** | Interface | IERC165 |||
| L | balanceOf | External | | | NO | |
| L | ownerOf | External | | NO| |
|NON |
| L | transferFrom | External V | | V | | | |
| L | setApprovalForAll | External | | | | NO | |
| L | getApproved | External | | NO| |
| L | isApprovedForAll | External [ | NO] |
| **IERC721Metadata** | Interface | IERC721 |||
| L | name | External | | NO| |
| L | symbol | External | | | NO|
| L | tokenURI | External | | NO | |
| **IERC721A** | Interface | IERC721, IERC721Metadata |||
| L | totalSupply | External | | NO | |
| **ERC721A** | Implementation | Context, ERC165, IERC721A |||
L | startTokenId | Internal 🗎 | | |
| L | _totalMinted | Internal 🖺 | | | |
 | supportsInterface | Public | | NO | |
| L | balanceOf | Public | | NO| |
 L | _numberMinted | Internal 🖺 | | |
 L | getAux | Internal A |
                        L | ownerOf | Public | | NO| |
 L | name | Public | | NO | |
 L | symbol | Public | |
                    | NO
 L | tokenURI | Public | | NO | |
 L | baseURI | Internal 🖺 | | |
 L | approve | Public | | NO | |
 L | getApproved | Public | | NO | |
| L | isApprovedForAll | Public | | NO | |
| L | transferFrom | Public | | (NO) |
```

```
| L | safeTransferFrom | Public | | ● | NO | | | | | | | | |
| L | safeTransferFrom | Public | |
| L | _exists | Internal 🖺 |
                         | L | _transfer | Private 🖺 | 🔘 | |
| L | burn | Internal 🗎 | 🔘 | |
| L | _burn | Internal A |
| L | approve | Private 🖺 | 🔘 | |
| L | checkContractOnERC721Received | Private 🖺 | 🔘 | |
| L | _beforeTokenTransfers | Internal 🖺 | 🔘 | |
| L | afterTokenTransfers | Internal 🖺 | 🔘 | |
| **IERC721AQueryable** | Interface | IERC721A |||
| L | explicitOwnershipOf | External | | | NO | | | L | explicitOwnershipsOf | External | | NO | |
| L | tokensOfOwnerIn | External | | | NO | |
| L | tokensOfOwner | External | | | NO | |
| **ERC721AQueryable** | Implementation | ERC721A, IERC721AQueryable |||
| L | explicitOwnershipOf | Public | | NO | |
| L | explicitOwnershipsOf | External | | | NO | |
| L | tokensOfOwnerIn | External | | | NO| |
| L | tokensOfOwner | External | | NO | |
| **SonokineticRetroPlates** | Implementation | ERC721AQueryable, Ownable,
ReentrancyGuard | | |
| L | whitelistMint | Public | | | | mintCompliance mintPriceCompliance |
| L | mint | Public | | I | mintCompliance mintPriceCompliance |
| L | mintForAddress | Public | | ● | mintCompliance onlyOwner |
| L | setCost | Public | | OnlyOwner |
L | setHiddenMetadataUri | Public | | onlyOwner |
L | setUriPrefix | Public | onlyOwner |
| L | setPaused | Public | | OnlyOwner |
| L | setMerkleRoot | Public | | OnlyOwner |
| L | withdraw | Public | | OnlyOwner nonReentrant |
| L | baseURI | Internal 🖺 | | |
Legend
| Symbol | Meaning |
|:----|
  Function can modify state |
   Function is payable |
```

Conclusion

The contracts are written systematically. Team found no critical issues. So, it is good to go for production.

Since possible test cases can be unlimited and developer level documentation (code flow diagram with function level description) not provided, for such an extensive smart contract protocol, we provide no such guarantee of future outcomes. We have used all the latest static tools and manual observations to cover maximum possible test cases to scan Everything.

Security state of the reviewed contract is "Well Secured".

- ✓ No volatile code.
- ✓ No high severity issues were found.

Disclaimer

This is a limited report on our findings based on our analysis, in accordance with good industry practice as of the date of this report, in relation to cybersecurity vulnerabilities and issues in the framework and algorithms based on smart contracts, the details of which are set out in this report. In order to get a full view of our analysis, it is crucial for you to read the full report. While we have done our best in conducting our analysis and producing this report, it is important to note that you should not rely on this report and cannot claim against the team on the basis of what it says or doesn't say, or how team produced it, and it is important for you to conduct your own independent investigations before making any decisions. team go into more detail on this in the below disclaimer below – please make sure to read it in full.

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