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Technical Standards and Norms in the WSS sector of Romania

**Standarde si norme tehnice
In sectorul de apa si canalizare in Romania**



Factors involved in the water/wastewater sector decisions /

Factori implicati in decizii in sectorul de apa/canal:

Institutional	Social
Political	Economical
Technical	

WSS
Sector

Great importance and impact / **Importanta mare, impact puternic**

Large, covers wide range and many fields / **Domeniu vast, acopera o arie mare de preocupari si multe domenii ingineresti**



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- ❑ **Necessity** – management of all the different aspects in a unitary manner
- ❑ **Different bodies** to manage sides of the same whole
- ❑ **Interaction** with other fields of activity, bodies of decision and authorities



Unified approach, steady rules and established methods

Similar cases have to lead to similar decisions

Inter-operability, repeatability, long-term usability

Clearly defined responsibility, well structured hierarchy of decision

Abordare unitara, reguli stabile si metode bine puse la punct

Cazuri similare trebuie sa duca la decizii similare

Asigurarea inter-operabilitatii, repetabilitatii si utilizarii pe termen lung a criteriilor de evaluare folosite

Definirea clara a responsabilitatilor si o structura clara a ierarhiei decizionale



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ep4sa

WSS
Sector

Water resources management and protection

Water prelevation, water quality; sources – design, build, maintenance

Water treatment - design, build, maintenance

Water distribution – pumping, networks - design, build, maintenance

Wastewater collection - pumping, networks - design, build, maintenance

Wastewater treatment - design, build, maintenance

Treatment sub-products management and disposal

Environment protection involvement



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- **European Directive** – document which establishes targets and goals to be achieved by member states. The means to achieve these goals remain up to each national authority
- **Directiva Europeana** – document ce stabileste tinte si obiective de atins de catre statele membre ale Uniunii Europene. Modul de atingere a acestor obiective este la latitudinea autoritatilor nationale.

Examples:

- ❑ Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption
- ❑ Directive 93/38/EEC coordinating the procurement procedures of entities operating in the water, energy, transport and telecommunications sectors (amended by Directive 98/4/EC)
- ❑ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment
- ❑ Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water



➤ Law

The laws are necessary because they are used to impose strongly those elements of the WSS which need a high level of security in implementation. It is the case of the aspects with impact in human health and in preservation of water resources. Also, laws are used to adapt European Directives to Romanian legislation. There are technical aspects which are stated by law – where issues connected to human health are involved or when environmental issues are concerned:

! Laws declare that all the Romanian waters have to be considered sensitive receptors.

The sanitary protection of the water sources and the means to preserve them clean are also subject to a law.

Also, the basic rules for the activity of water sector operators and their relationship with assets owners and with the beneficiaries are defined by law.



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- **Normative** – documents and documentations made in order to describe the way something ought to be done according to a value position. They are closer to manuals or guides and are intended to give a line of best practice methods. The normatives are elaborated by special designated commissions and committees and are approved through Governmental Decisions or Ministerial Orders.

Some normatives are approved by laws and governmental decisions and they express the ways of implementing the EU Directives into the Romanian local conditions.

The normatives refer to the usual conditions and situations and ensure similar approach to common situations.

Normatives are dedicated to complete guidance in certain conditions, stating rules for design, build, exploitation and maintenance.

Also, there are normatives dedicated to the procedures to be fulfilled in order to obtain some of the necessary permits in the water and wastewater field of activity.



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- **Normative** – documente si documentatii realizate cu scopul de a descrie cum ar trebui realizat ceva avand ca reper un obiectiv de atins. Sunt ca un fel de manuale sau ghiduri si au ca scop sa ofere o atitudine de tip “cea mai buna practica in domeniu”. Sunt elaborate de comisii tehnice de specialitate special numite si sunt aprobate prin Hotarari de Guvern sau prin Ordine de Ministru

Unele normative sunt aprobate prin lege sau hotarari de guvern si exprima modele de implementare a Directivelor Europene in legislatia romaneasca.

Normativele se refera la conditii si situatii uzuale si asigura abordari similare in conditii similare.

Normativele sunt dedicate oferirii de instructiuni complete in anumite conditii stabilind reguli pentru proiectare, executie, exploatare si intretinere.

Exista deasemenea normative dedicate procedurilor ce trebuiesc indeplinite pentru obtinerea aprobarilor si avizelor necesare in domeniul alimentariilor cu apa si canalizarilor.



➤ Standards

- the standard is a document, established by consensus and approved by an empowered body, which assures, for common and repeated use, directive lines or characteristics for activities and their results, with the purpose of obtaining the optimal order degree within a certain context.
- **The standards** vary as subject, volume and character including many disciplines: beginning with all the technical, economical, and social data of the human activity and finishing with all the basic disciplines like language, mathematics and physics.
- A standard should be:
 - coherent and consequent
 - resulting from the participation
 - active processes
 - available for everyone
 - up to date
 - reference status in commercial contracts and in the court of law in the case of a dispute date
 - have national or international recognition



➤ Standarde

- standardul este un document realizat prin consens si aprobat de un organism imputernicit ce asigura pentru utilizare obisnuita si repetata linii directoare sau caracteristici pentru activitati si rezultatele acestora, cu scopul de a se obtine obiectivul optim intr-un context dat.
- **Standardele** variaza ca subiect, volum si caracter incluzand multe discipline: incepand cu toate datele tehnice, economice si sociale ale activitatilor umane si incheind cu toate disciplinele de baza cum ar fi limbajul, matematica, fizica.
- un standard trebuie sa fie:
 - coerent si consecvent
 - rezultat al implicarii multiple
 - un proces activ
 - disponibil
 - la zi
 - referentiat in contracte comerciale sau in caz de dispute juridice
 - recunoscut la nivel national sau international



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Standards are exclusively technical references.

According to the Romanian legislation the standards are not compulsory.

Their use is a matter of choice.

Standardele sunt exclusiv referinte tehnice.

Conform legislatiei romanesti, standardele nu sunt obligatorii.

Respectarea lor este o chestiune de optiune

Legislation gives to the responsible bodies the liberty to chose if the standards should be considered compulsory in the area of their operations. Usually this is the case, but uncommon situations are treated separately.

Legislatia da institutiilor responsabile libertatea de a alege daca standardele trebuie considerate obligatoriu in zona lor de operare.

De obicei asta se si intampla, dar situatiile iesite din comun se pot trtata separat.

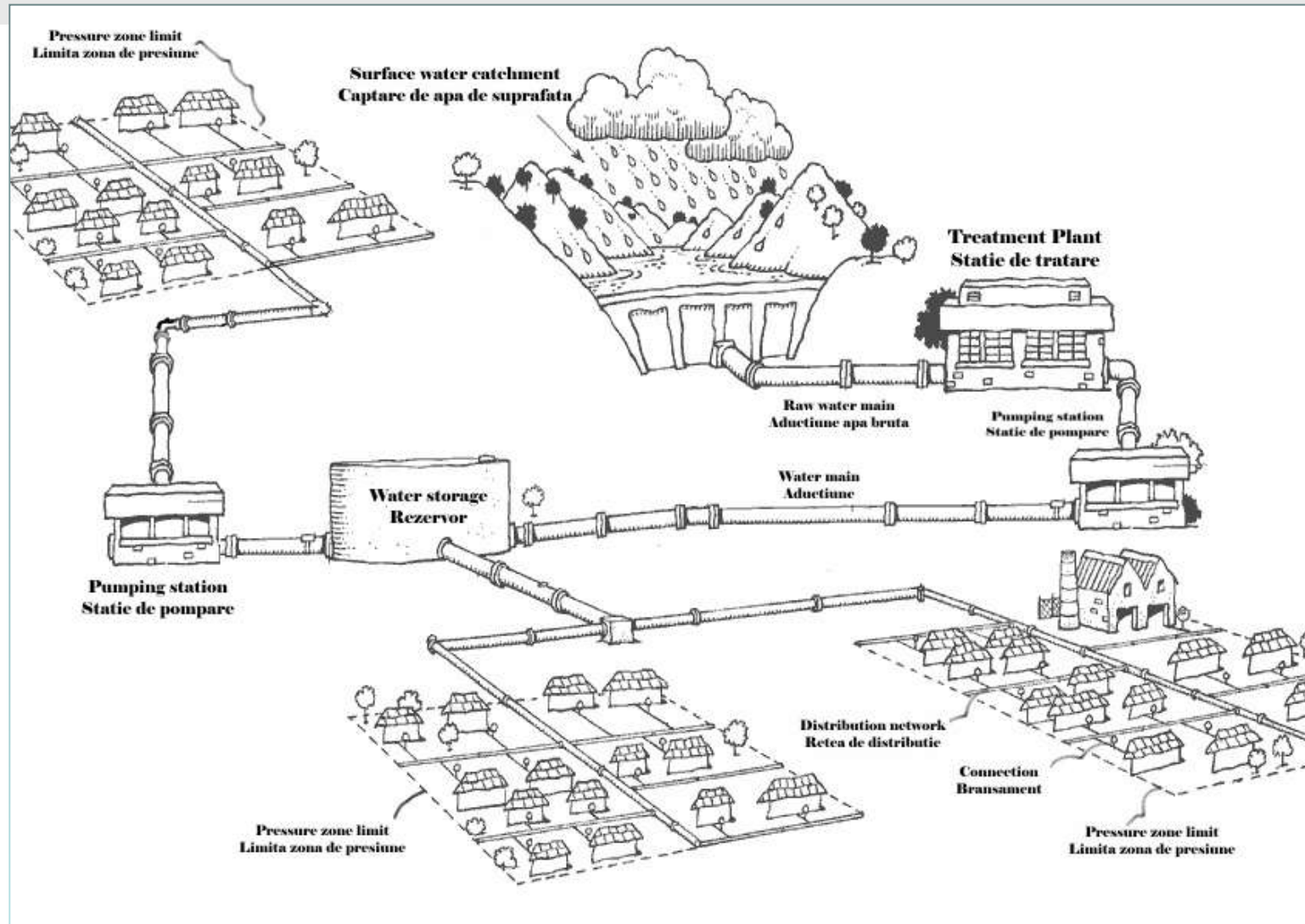


Types of standards / Tipuri de standarde

- Standards for fundamental prescriptions that are referring to terminology, metrology, symbols, conventions and signs / Standarde pentru prescriptii fundamentale ce se refera la terminologie, masurari, simboluri, conventii, semne conventionale
- Standards for test methods and for analysis which measure the characteristics / Standarde pentru metode de testare si analiza pentru masurarea unor caracteristici
- Standards that are defining the characteristics of a product or a specification for a service / Standarde ce definesc caracteristicile unui produs sau o specificatie pentru un serviciu
- Organization standards that are referring to the description of the functions of a company and to the relations between them and the structure of the activities / Standarde la nivel de organizatie ce se refera la descrierea functiunilor intr-o companie si la relatiile dintre structura de activitati din componenta



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Standards with general application in water supply:

- ❑ **STAS 4273-83** – clasification of hydro-technical constructions in importance classes
- ❑ **SR 1343 – 1/2006** - Water supply – Part 1 – Calculation of the water quantities for urban and rural habitations
 - ❑ Indications regarding the average water consumption per capita depending on the type of habitation and the type of residential facilities
 - ❑ Difference between demand and necessity in water consumption
 - ❑ elements for evaluation of the consumption variation in time (daily)
 - ❑ basis of the calculation of water storage storage facilities based on volumes and compensation of min-max variations
- ❑ **STAS 1478-90** – Water supply for civil and industrial buildings – Basic principles for design
 - ❑ Old, but still effective; many of its details were taken to new standards; still useful because things are considered together, as a whole
- ❑ **SR ISO 4427** – Polyethylene pipes for water distribution – Technical specifications
 - ❑ Standard notation, characteristics and clasification
- ❑ **Government Decision 930/11.08.2005** – regarding sanitary protection zones for water supply instalations



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Standarde cu aplicabilitate generala in alimentari cu apa:

- ❑ **STAS 4273-83** – Incadrare in clase de importanta a constructiilor hidrotehnice
- ❑ **SR 1343 – 1/2006** – Alimentari cu apa– Partea 1 – Determinarea cantitatilor de apa potabila pentru localitati urbane si rurale
 - ❑ Indicatii privind considerarea consumului mediu normat pe cap de locuitor in functie de tipul residential si dotarea cu facilitati
 - ❑ Diferenta dintre cerinta si necesar de apa
 - ❑ Elemente privind variatia zilnica a consumului
 - ❑ Calculul capacitatii de stocare a rezervoarelor
- ❑ **STAS 1478-90** – Alimentarea cu apa la constructii civile si industriale – Prescriptii de proiectare
 - ❑ Standard vechi dar eficient si util; cele mai multe dintre prevederile sale au fost preluate in mai multe standarde mai noi; aici se regasesc sintetizate
- ❑ **SR ISO 4427** – Tevi de polietilena pentru distributia apei –Specificatii Technice
 - ❑ Notatie standard, caracteristici si clasificari
- ❑ **HG 930/11.08.2005** – privind zonele de protectie sanitara a instalatiilor de alimentare cu apa



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□ Water source

- **NTPA 013** –Quality norms to be fulfilled by surface water used for potabilisation
- **NTPA 014** – Normative regarding measurement methods and sampling/analysis frequency for surface water for potabilisation
- **SR 1628-2/1996** – Water supply – Surface water sources. Studies, investigations, laboratory determinations
- **STAS 1629/3** – Water intakes from underground drains. General design guidelines
- **STAS 1629/4** – Water intakes from rivers. General design guidelines
- **STAS 1629/5** – Water intakes from lakes. General design guidelines
- **NP028-98** – Normative for design of water catchment construction
- **SR 12303**- Water quality – Measurement of Cesium 137 quantities
- ...and all the standards, norms and laboratory methods for water quality determination

□ Water mains

- **Normative I22** (1999, modified and completed in 2002) – Design and execution of water mains and water supply networks and sewerage networks
- **SR 6819** – Water supply – Water mains – Studies, design and execution prescriptions
 - minimum amount and type for necessary studies
 - instalation of devices – sectorisation valves, aeration valves, emptying valves, mounting-dismounting compensation, thrust blocks
 - protection



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□ Surse

- **NTPA 013** –Norme de calitate pe care trebuie să le îndeplinească apele de suprafață utilizate pentru potabilizare
- **NTPA 014** – Normativ privind metodele de masurare si frecventa de prelevare de probe si analiza pentru apele de suprafață utilizate pentru potabilizare
- **SR 1628-2/1996** – Alimentari cu apa– Surse de suprafata. Studii, investigatii, determinari de laborator
- **STAS 1629/3** – Captari de apa subterana prin drenuri. Prescriptii generale de proiectare
- **STAS 1629/4** – Captari de apa din rauri. Prescriptii generale de proiectare
- **STAS 1629/5** – Captari din lacuri. Prescriptii generale de proiectare
- **NP028-98** – Normativ pentru proiectarea constructiilor de captare a apei
- **SR 12303**- Calitatea apei – Determinarea continutului de cesiu 137
- ...precum si toate standardele, normele si metodele de laborator pentru determinarea calitatii apei

□ Aductiuni

- **Normativ I22** (1999, modificat si completat in 2002) – Proiectarea si executia aductiunilor, a retelelor de distributie a apei si a retelelor de colectare a apelor uzate
- **SR 6819** – Alimentari cu apa – Aductiuni – Studii, prescriptii de proiectare si executie
 - tipul si nivelul studiilor de efectuat
 - Tipuri de armaturi– vane de sectorizare, aerare, golire, compensatori de montaj, masive de ancoraj
 - zone de protectie





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□ Water treatment

- **SR 9296** – Water supply – Chlorination plants with gas chlorine – General prescriptions for design
- **SR13158** – Water supply – Calculation of the chlorination rate for disinfection
- **P84-88** – Technical guidelines for design of gravitational sand filters
- **STAS 1712/1** – Quartz sand and gravel for water filtration and clogging prevention. General quality conditions.
- **STAS 1712/2** – Quartz sand and gravel for water filtration and clogging prevention. Determination of SiO₂ in sand.
- **STAS 1712/3** – Quartz sand and gravel for water filtration and clogging prevention. Determination of organic matter in sand
- **SR 12362/1996** – Water supply – Reagents preparation facilities. Design guidelines.
- **STAS 3573** – Water supply – Clarifiers. Design guidelines
- **STAS 3602** – Gravitational sand filters. Design guidelines
- **STAS 3620/1** – Gravitational clarifiers. Design guidelines
- **STAS 3620/2** – Suspensional clarifiers with mechanical recirculation of sludge. Design guidelines
- **STAS 9295** – Iron and manganese removal facilities. Design guidelines



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□ **Tratarea apei potabile**

- **SR 9296** – Alimentari cu apa – Statii de clorare cu clor gazos– Prescriptii generale de proiectare
- **SR13158** – Alimentari cu apa – Calculul dozei de clor pentru dezinfectie
- **P84-88** – Specificatii tehnice pentru proiectarea filtrelor gravitationale cu nisip
- **STAS 1712/1** – Nisip si pietris cuartos pentru filtrarea apei si prevenirea innisiparii. Conditii generale de calitate.
- **STAS 1712/2** – Nisip si pietris cuartos pentru filtrarea apei si prevenirea innisiparii. Determinarea bioxidului de siliciu din nisip.
- **STAS 1712/3** – Nisip si pietris cuartos pentru filtrarea apei si prevenirea innisiparii. Determinarea substantelor organice din nisip.
- **SR 12362/1996** – Alimentari cu apa – Gospodarii de reactivi. Prescriptii de proiectare.
- **STAS 3573** – Alimentari cu apa – Decantoare. Prescriptii de proiectare
- **STAS 3602** – Filtre de nisip cu nivel liber. Prescriptii de proiectare
- **STAS 3620/1** – Decantoare cu separare gravimetrica. Prescriptii de proiectare
- **STAS 3620/2** – Decantoare suspensionale cu recircularea mecanica a namolului. Prescriptii de proiectare.
- **STAS 9295** – Statii de deferizare si demanganizare. Prescriptii de studii si proiectare.



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❑ Water distribution

- ❑ **STAS 6002** – Connection manholes for water supply. Technical specifications.
- ❑ **SR EN 1508** – Guidelines for systems and components for water storage
- ❑ **SR 4163 -1** – Distribution networks. Basic design guidelines.
- ❑ **SR 4163 – 2** – Distribution networks. Guidelines for calculation.

❑ Retele de distributie

- ❑ **STAS 6002** – Camine pentru bransamente de apa. Prescriptii tehnice.
- ❑ **SR EN 1508** – Alimentare cu apa. Prescriptii pentru sistemele si componentele pentru inmagazinarea apei
- ❑ **SR 4163 -1** – Retele de distributie. Prescriptii de proiectare.
- ❑ **SR 4163 – 2** – Retele de distributie. Prescriptii de calcul.



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Typical scheme of a sewerage system
Schema standard pentru un sistem de canalizare





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Wastewater collection networks

- ❑ **SR 1846 - 1** - Sewerage – Design guide - Part 1 – Estimation of urban wastewater flow (*return rate, PE*)
- ❑ **SR 1846 - 2** - Sewerage – Design guide - Part 2 – Estimation of stormwater flows
- ❑ **SR EN 752 - 1** - Sewerage systems - Part 1 – General issues and definitions
- ❑ **SR EN 752 - 2** - Sewerage systems - Part 2 – Performance conditions
- ❑ **SR EN 752 - 3** - Sewerage systems - Part 3 – General design guidelines
- ❑ **SR EN 752 - 4** - Sewerage systems - Part 4 – Hydraulic dimensioning and environmental references
- ❑ **SR EN 752 - 5** - Sewerage systems - Part 5 – Rehabilitation
- ❑ **SR EN 752 - 6** - Sewerage systems - Part 6 – Pumping instalations
- ❑ **SR EN 752 - 7** - Sewerage systems - Part 7 – Maintenance and exploitation
- ❑ **STAS 3051-91** – Sewerage systems – Colectors for sewerage networks.
- ❑ **SR EN 124** – Covering devices and locking for manholes and draining lids in road beds and walkways. Technical specifications
- ❑ **STAS 6701** – Stormwater discharge manholes with syphon and settling barrel.



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Retele de colectare apa uzata

- ❑ **SR 1846 - 1** - Canalizari exterioare - Prescriptii de proiectare - Partea 1 Determinarea debitelor de ape uzate de canalizare (rata de retur, populatie echivalenta)
- ❑ **SR 1846 - 2** - Canalizari exterioare - Prescriptii de proiectare - Partea 2 Determinarea debitelor de ape meteorice
- ❑ **SR EN 752 - 1** - Retele de canalizare in exteriorul cladirilor - Partea 1 - Generalitati si definitii
- ❑ **SR EN 752 - 2** - Retele de canalizare in exteriorul cladirilor - Partea 2 - Conditii de performanta
- ❑ **SR EN 752 - 3** - Retele de canalizare in exteriorul cladirilor - Partea 3 - Prescriptii generale de proiectare
- ❑ **SR EN 752 - 4** - Retele de canalizare in exteriorul cladirilor - Partea 4 - Dimensionare hidraulica si consideratii referitoare la mediu
- ❑ **SR EN 752 - 5** - Retele de canalizare in exteriorul cladirilor - Partea 5 - Reabilitare
- ❑ **SR EN 752 - 6** - Retele de canalizare in exteriorul cladirilor - Partea 6 - Instalatii de pompare
- ❑ **SR EN 752 - 7** - Retele de canalizare in exteriorul cladirilor - Partea 7 - Intretinere si exploatare
- ❑ **STAS 3051-91** – Sewerage systems – Collectors for sewerage networks.
- ❑ **SR EN 124** – Dispozitive de acoperire si de inchidere pentru camine de vizitare si guri de scurgere in zone carosabile si pietonale
- ❑ **STAS 6701** – Guri de scurgere cu sifon si depozit



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❑ Wastewater Treatment Plants

- ❑ **STAS 10859** – Wastewater treatment plants for wastewater from human habitations. Studies for design.
- ❑ **STAS 12264** – Oil and grease removal in wastewater treatment plants. General design guidelines.
- ❑ **SR 12278** - Digesters for wastewater treatment plants. General design guidelines.
- ❑ **STAS 11565** – Platforms for digested sludge dewatering in wastewater treatment plants
- ❑ **STAS 11506** – Activated sludge basins. General design guidelines
- ❑ **STAS 12431** – Screens for wastewater treatment plants.
- ❑ **STAS 4162/1** – Primary settling tanks. General design guidelines
- ❑ **STAS 4162/2** - Secondary settling tanks. General design guidelines

.....etc...



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□ **Statii de epurare a apelor uzate**

- **STAS 10859** – Canalizari. Statii de epurare a apelor uzate provenite de la centrele populate. Studii pentru proiectare.
- **STAS 12264** – Canalizari. Separatoare de uleiuri si grasimi la statiile de epurare orasenesti. Prescriptii generale de proiectare
- **SR 12278** – Rezervoare de fermentare pentru statii de epurare a apelor uzate. Prescriptii generale de proiectare.
- **STAS 11565** – Platforme pentru uscarea namolului fermentat din statiile de epurare orasenesti.
- **STAS 11506** – Bazine cu namol activat. Prescriptii generale de proiectare
- **STAS 12431** – Gratare pentru statiile de epurare a apelor uzate orasenesti.
- **STAS 4162/1** – Decantoare primare. Prescriptii generale de proiectare
- **STAS 4162/2** – Decantoare secundare. Prescriptii generale de proiectare

.....etc...



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Wastewater treatment sludge

- ❑ **NP 118-06** – Normative for design for constructions and instalations in domestic wastewater treatment – Part 5: Sludge treatment
- ❑ **Order nr. 49/2004** – Technical norms for environment protection, especialy soils, when using wastewater treatment sludge in agriculture
- ❑ **Order 344/708 din 2004** of Ministry of Environment protection and Ministry of Agriculture, modified si completed by **OM 27/2007** regarding the value of the agricultural and chemical potential of wastewater treatment sludge, prevention and decrease of the bad effects on soils, water, vegetation animals and people by the means of corect use

Namol rezultat din epurarea apei uzate

- ❑ **NP 118-06** – Normativ pentru proiectarea construcțiilor si instalatiilor de epurare a apelor uzate orasenesti - Partea 5 - Prelucrarea namolurilor
- ❑ **Ordin nr. 49/2004** – Norme tehnice pentru protectia mediului, in special a solurilor, atunci cand se foloseste namolul din statiile de epurare in agricultura
- ❑ **Ordin 344/708 din 2004** comun al Ministerului Mediului si Ministerului Agriculturii, modificat si completat prin OM 27/2007 privind valoarea potentialului chimic in agricultura a namolului din epurarea apelor uzate, prevenirea si reducerea efectelor negative asupra solurilor, apelor vegetatiei, animalelor si oamenilor prin asigurarea unei utilizari judicioase.