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Territorial **A**ction **P**lan to
prevent
Flooding **R**isks in the
Valencian **R**egion

Valencia, April 14th, 2008



Dirección General de Ordenación del Territorio
CONSELLERIA DE MEDIO AMBIENTE, AGUA, URBANISMO Y VIVIENDA



The Valencian Region is among the Spanish regions with greater risk of flooding in Spain.

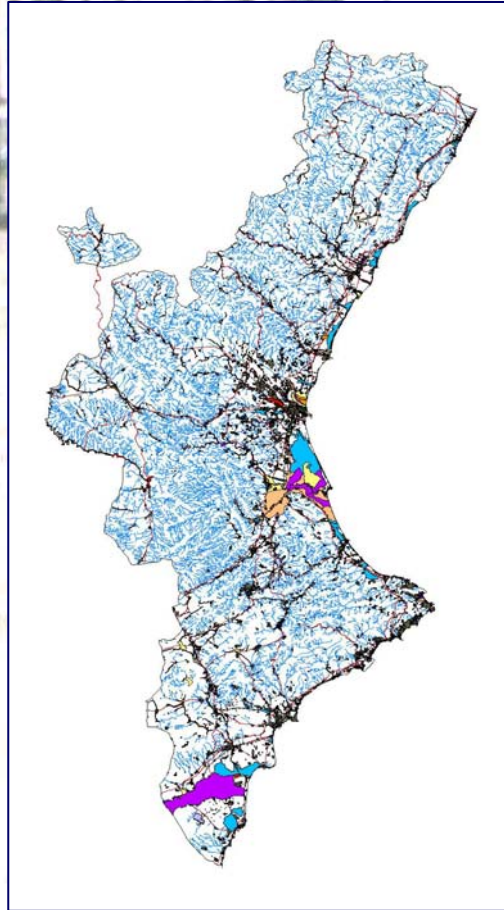
CAUSES



- **Mediterranean climate**
- **Land morphology**
- **High population density in risk areas**



MAP OF FLOODING RISK AREAS

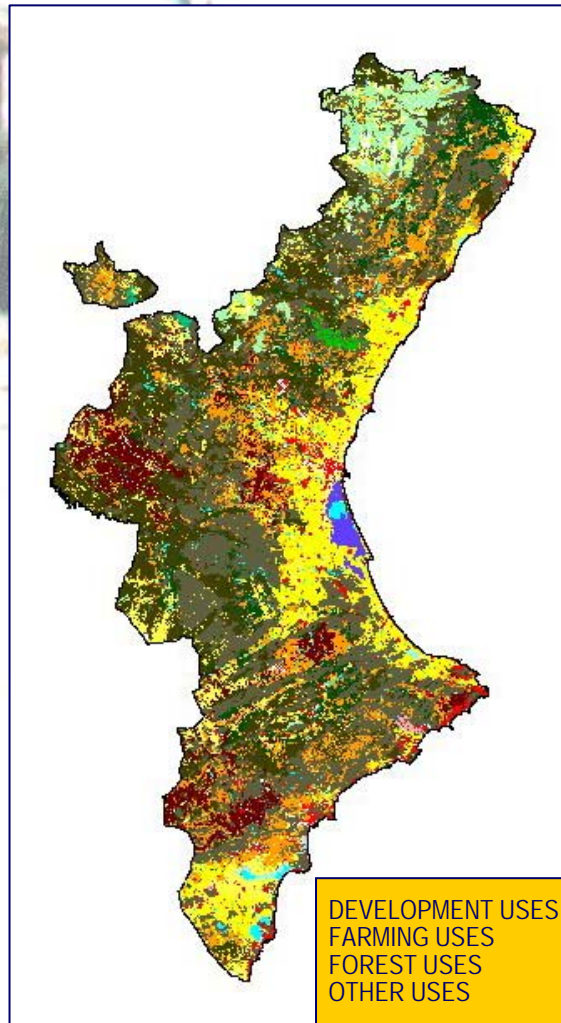


| | Frequency | Soak (heigh of water) |
|---|-----------------|--------------------------|
| 1 | HIGH (25) | HIGH (>0.80) |
| 2 | MEDIUM (100) | HIGH (>0.80) |
| 3 | HIGH (25) | LOW (<0.80) |
| 4 | MEDIUM (100) | LOW (<0.80) |
| 5 | LOW (500) | HIGH (>0.80) |
| 6 | LOW (500) | LOW (<0.80) |

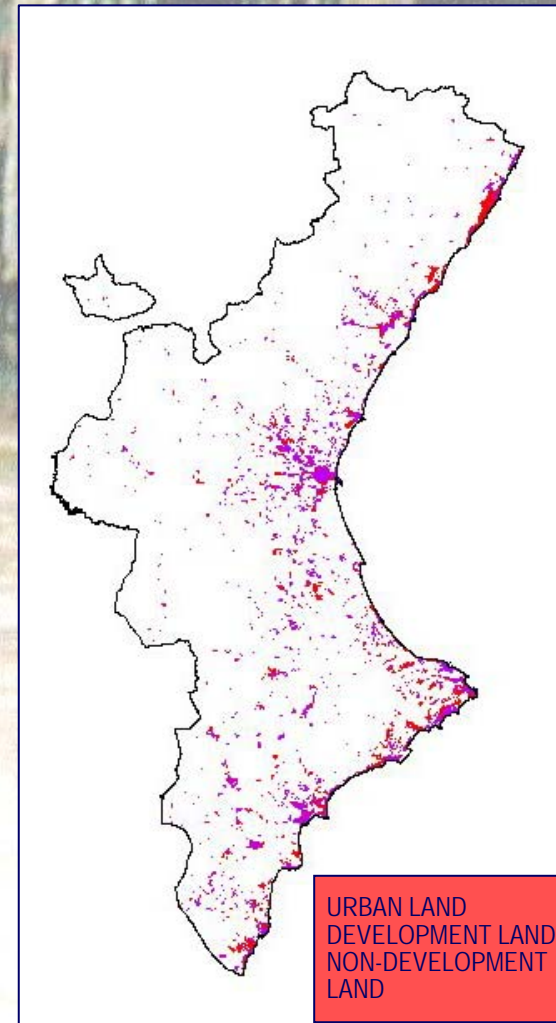
6 levels of risk are established according to 3 frequency intervals and 2 soak intervals. Scale: 1:50.000



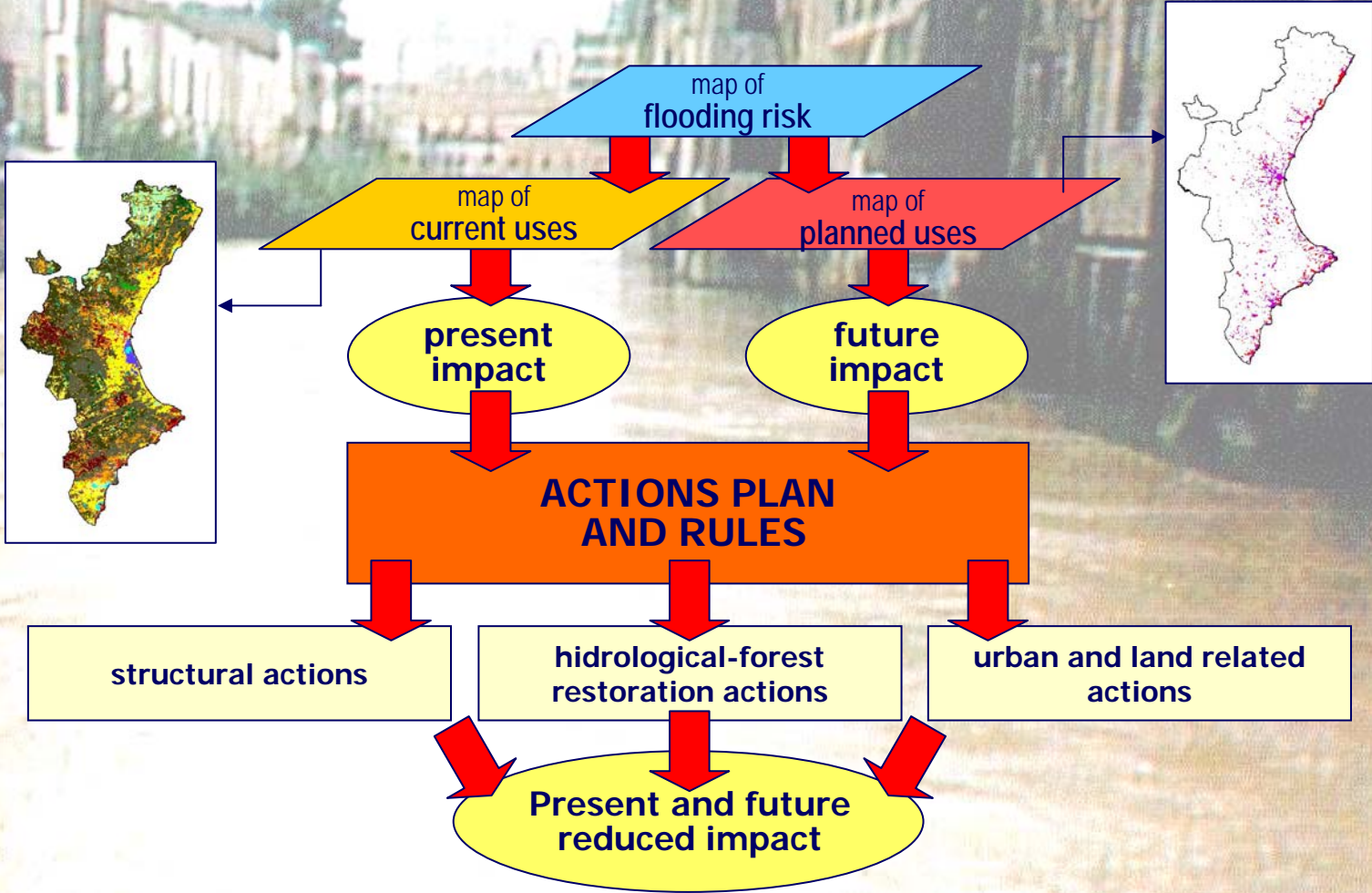
MAP OF CURRENT USES



MAP OF PLANNED USES



METHODOLOGY





RESULTS

- 278 flooding areas
- 1.256 km² (5.4% of the territory).
- 393 of 541 municipalities hit by floods
- 79% of present impact affects urban uses.
- if all building land is developed, **future impact will rise by 55%.**





STRUCTURAL ACTIONS

- **of corrective** nature
- 153 actions
- € 870 million
- **reducing** **current**
impact by 40%



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HIDROLOGICAL AND FOREST RESTORATION ACTIONS

- of **double nature:** risk decreasing and environmental improvements
- 64 actions (16 of high priority).
- € 13.2 millon (high priority ones).
- reducing present impact by 2%.





URBAN AND LAND ACTIONS

- **of preventive nature,**
- **aimed at reducing future impact,**
- **included in the Plan Rules,**
- **regulating land use and building requirements**
- **with no financial cost.**



DOCUMENTATION

1

Report

2

Env. Impact Assessment

3

Actions programme

4

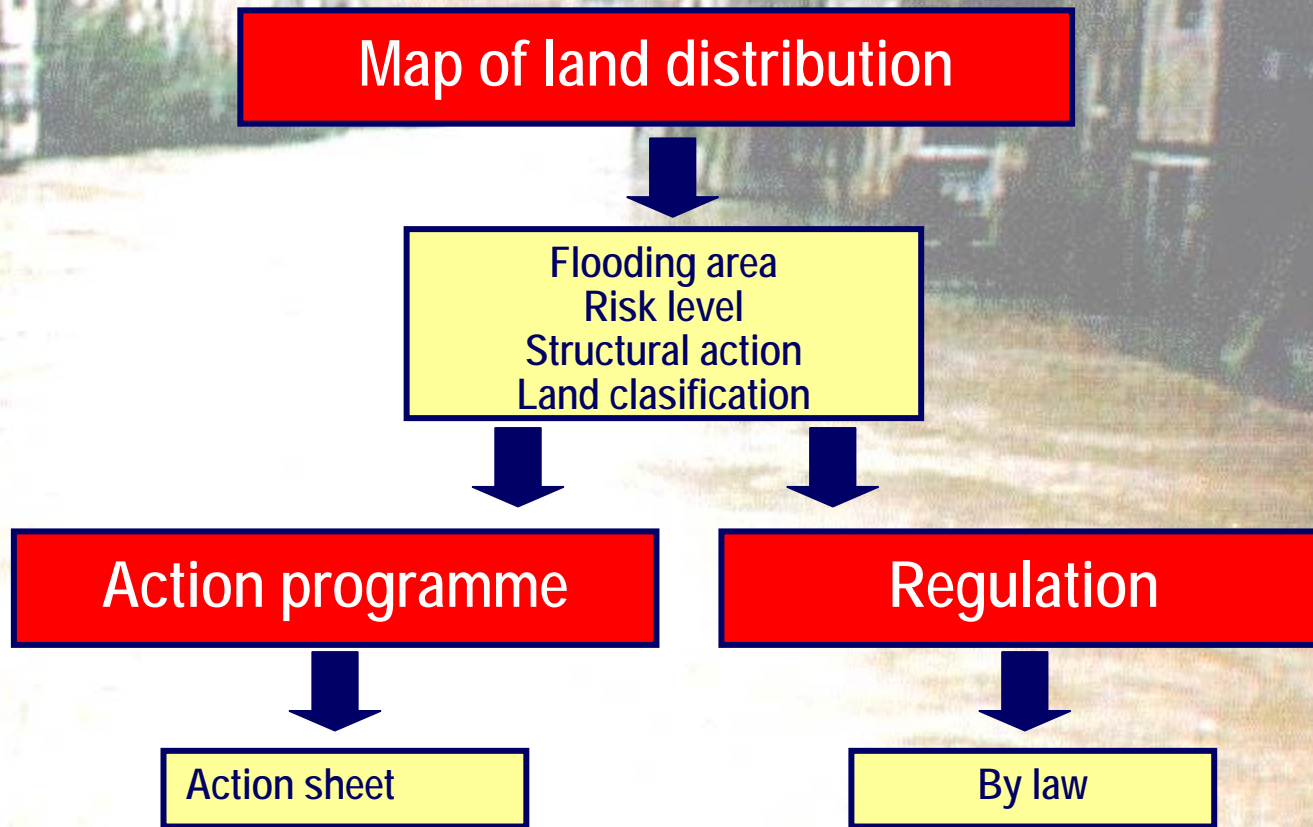
Map of land distribution

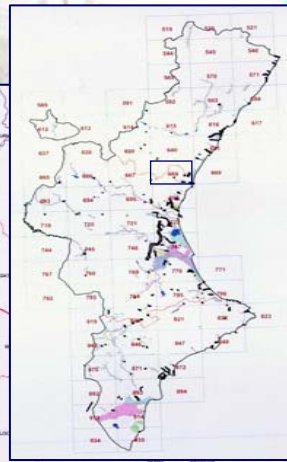
5

Regulation

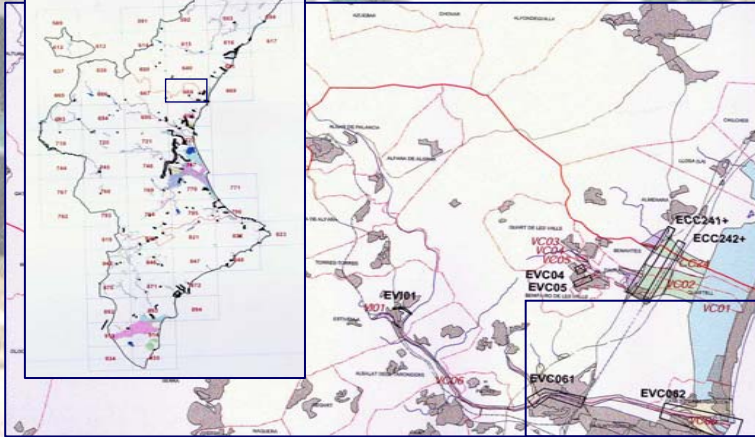


PATRICOVA MANAGEMENT

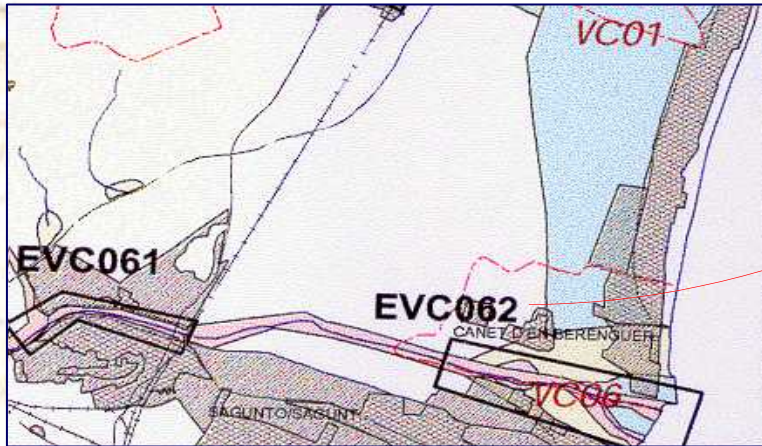




Guide map



sheet 668 (scale 1:50.000)

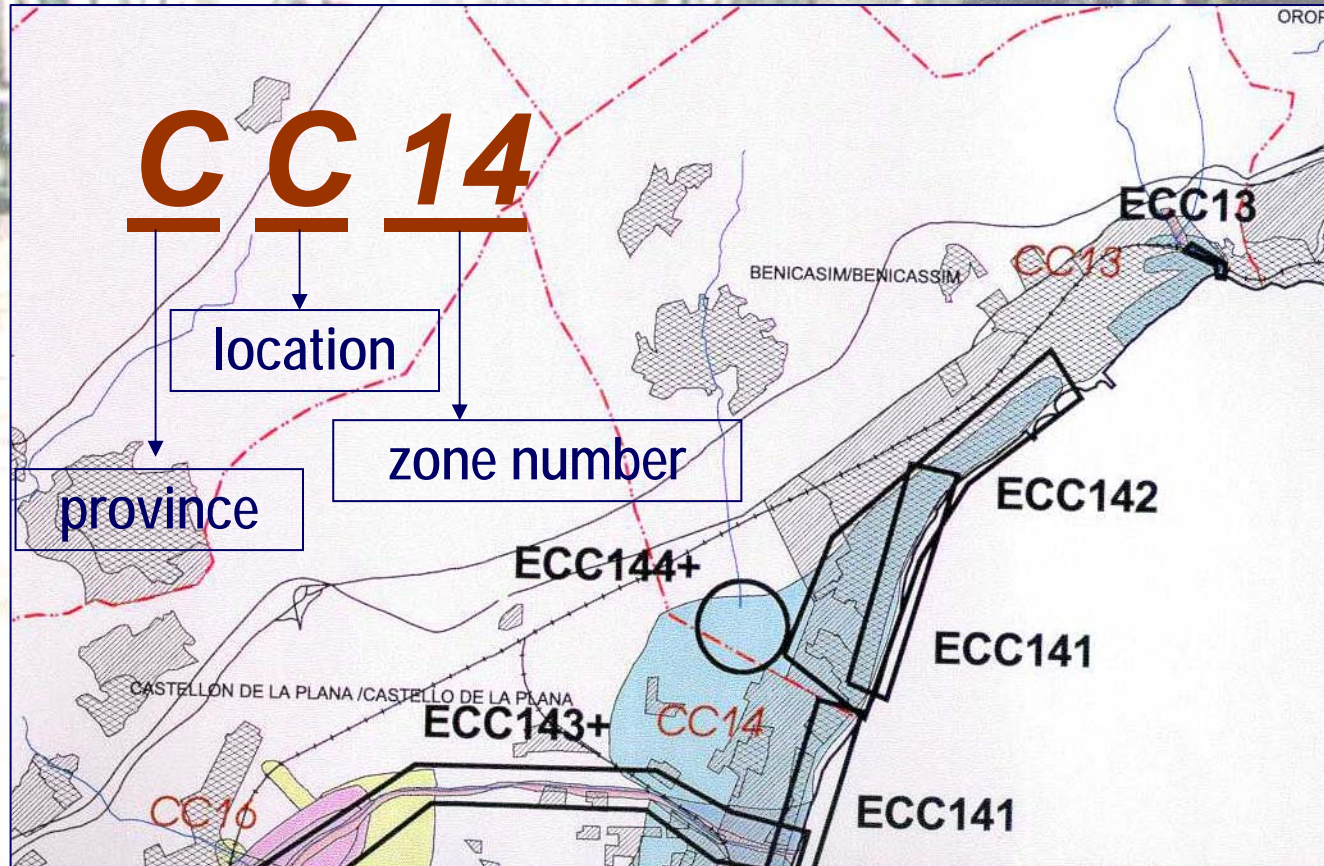


| | | |
|--|--|----------------------------------|
| Título: Encauzamiento del tramo final del río Palancia | | Código: EVC062 |
| Zona: Cono del río Palancia (VC06) | | |
| Descripción de la medida: Encauzamiento del tramo final del río Palancia y construcción de un nuevo puente (demolición del anterior) en la carretera de Sagunto a Canet de Berenguer carretera CV-320 (VV-7015). También se deben suprimir o señalizar los dos badenes situados en la desembocadura. La longitud del encauzamiento es de 2.500 metros y la capacidad hidráulica recomendable es de $Q(500) + 2.300$ m ³ /s. Debe contemplarse el aseguramiento de un nivel de protección adecuado al centro hospitalario, modificado por el nuevo puente en la carretera a Els Valls. | | |
| Municipios: Sagunto Canet de Berenguer | Localización: | |
| Hojas: 668 696 | | |
| Objetivo: Incremento umbral de desbordamiento / Eliminación punto crítico | | |
| Descripción del problema resuelto: Proteger Canet y el Puerto de Sagunto frente a desbordamientos del río Palancia en la zona de su desembocadura. | | |
| Oportunidad | Actuación contemplada en el PHJ (03.04). Proyecto en estudio en COPUT. | |
| Efectos negativos: | 1.- Impacto sobre el ecosistema ripario. | |
| Alternativas: 1.- Solución de paso elevado en la carretera de la costa. | Coordinación con: EVC061, Sagunto, Canet de Berenguer | |
| Agente encargado: | CHJ | Tiempo estimado: 12 meses |
| Prioridad: | ALTA | Coste: 1 900 mpts. |

Structural action sheet



CODING OF FLOODING AREAS



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URBAN DEVELOPMENT REGULATIONS: PREMISES

- **In Urban Land and Development Land where an Integrated Action Plan (urban development action) has been approved, structural actions must be implemented in order to reduce risks.**
- **Preventive work in Non-Urban Lands (no authorising land reclassification) and in Development Land where no Integral Action Plan has approved (conditioning land development).**
- **Future urban development directed at no flooding areas (considering municipalities features).**



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URBAN DEVELOPMENT REGULATIONS: MAIN ASPECTS

- **Non-Development Land under special protection: public hydraulic field and areas of risk 1 (art. 21.1)**
- **Planning cannot cause a significant risk increase (art. 21.3)**
- **Non-Development Land cannot be reclassified as Urban Land or Development Land, except in case of **municipalities with a high-risk** (article 22.1)**
- **Certain uses and activities (art. 22.2 & 3) will be forbidden in flooding Non-Urban Areas.**
- **Flooding Development Land without approved Integral Action Plan must be subject of a **flooding study** (art. 23.1)**
- **In Development Land with approved Integral Action Plan, adaptation of edifications (art. 24).**



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URBAN DEVELOPMENT REGULATIONS: ADAPTATION OF EDIFICATIONS

In areas **under flooding risk:**

One-floor buildings must have a roof accessible from the inside (article 27.1.a)

• **Buildings must face direction of overflow (article 27.1.b)**

• **Ground floor walls must be above street slope (article 27.1.c)**

• **Residential, industrial or commercial use of basements will be forbidden, except in the case of storage (article 27.2)**



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URBAN DEVELOPMENT REGULATIONS: ADAPTATION OF **ADDITIONAL** BUILDINGS:

Areas under risk **2, 3 and 4**:

- Basements not to be allowed, except for **intensive residential use**, in which case conditions are to be applied (article 28.1)
- Ground floor walls must be 80 cm above the street level (article 28.3.a)
- Doors and windows within 150 cm, as well as other sensitive elements within 70 cm, of the street level, must be able to be closed tightly. (article 28.3.b y c)
- Fences and walls must be permeable above a height of 40 cm (article 28.4)



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URBAN DEVELOPMENT REGULATIONS: INFRASTRUCTURES ADAPTATION

- In case of infrastructures in the middle of a flooding area, do not increase risk. Take care of transverse drainage of seafront promenades. (article 26.1 y 2)
- Infrastructures **design** return period: from 500 to 100 years, high vulnerability strategies; from 100 to 25 years those of medium vulnerability (article 26.3)
- Transverse drainage of lineal infrastructures, minimum free space of 1m (article 26.4)



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URBAN DEVELOPMENT REGULATION : STRUCTURAL ACTIONS

- **Protection level** of defence structures in urban areas, between 500 and 100 years; in no urban areas, between 100 and 25 years (article 32.1)
- **Covered channelling**, only in urban areas and 500 years old (article 32.2)
- **Rain drainages**, 15 years return period design. (article 34)



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URBAN DEVELOPMENT REGULATION : USE REQUIREMENT NEARBY RIVER BANKS

- **Development Land running adjacent to channeling must count on free spaces and green areas. (article 30.1)**
- **Throughout the land extension, minimum spaces required for gardens**
- **Promotion of the use of free spaces and green areas on the land nearby channeling (article 30.2).**



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URBAN DEVELOPMENT REGULATION : MUNICIPALITIES UNDER A HIGH FLOODING RISK

- Those with 2/3 parties of the municipal area affected or under strong restrictions. Direct development to no-flooding areas (article 19)
- **Provisional** situation
- General regulation regarding the banning of reclassification of Non-Urban Land is not to be applicable. (article 22.1)
- No requirements regarding reclassifications and compulsory flooding study.
- Trends towards intensive building concentrations, vs extensive models



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URBAN DEVELOPMENT REGULATION : FLOODING STUDIES

- **Purpose:** defining, widening and modifying the PATRICOVA (article 16.1)
- **Requirements:** suitable scale, created by a specialized technician, (article 16.2)
- **Documentation** (article 17):
 - ⇒ geomorphological study
 - ⇒ historical study of floodings
 - ⇒ hydrological study
 - ⇒ hydraulic study
 - ⇒ cartographies
- **Proceedings:** approved by the Conselleria, following report of Organismo de Cuenca (article 18)



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URBAN DEVELOPMENT REGULATION : FLOODING STUDIES

- **Compulsory:**

- ⇒ **development of Development Land without PAI (article 23.1)**

- ⇒ **reclassifications in municipalities under a high flooding risk (Second DA)**

- **Conclusions (article 17):**

- ⇒ **total or party land de-classification**

- ⇒ **introduction of conditions to detailed land distribution**

- ⇒ **performance of defence works with action charge**

- ⇒ **introduction of conditions in relation to shape**



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URBAN DEVELOPMENT REGULATION : FLOODING STUDIES

- To date, (since 28/01/03), more than 60 studies
- Scope: Territories of the Basin Authorities of the Rivers Júcar and Segura.
- Imposed **conditions**:
 - ⇒ performance of defence works
 - ⇒ changes on detailed development
 - ⇒ building requirements
 - ⇒ eliminating risk in specific roads and areas of community services (schools, hospitals, etc)
 - ⇒ without affecting third parties

